

Installation EVC-E/E2 Electronic Vessel Control	A B E
	1(1)

D4, D6, D11, D13
Volvo Penta IPS

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Safety Information

Read this chapter very carefully. It concerns your safety. It describes how safety information is presented in the installation manual and on the product.



This symbol is used in the manual and on the product to call attention to the fact that this is safety information. Always read such information very carefully.

Safety texts in the installation manual have the following order of priority:



DANGER!

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING!

Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.



CAUTION!

Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

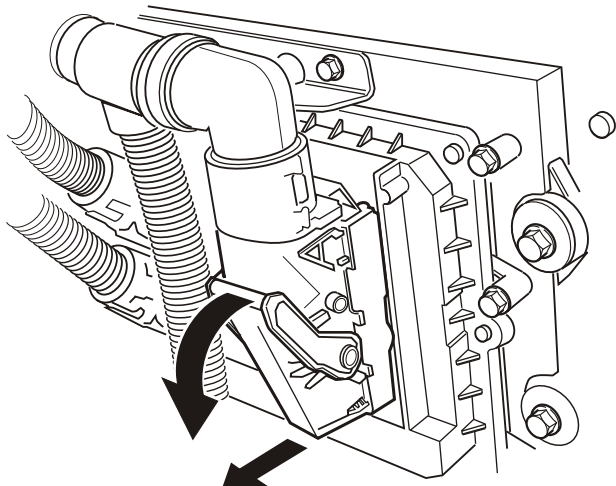
IMPORTANT!

Indicates a situation which, if not avoided, could result in property damage.

NOTICE! Used to draw attention to important information that will facilitate work or operations.



This symbol is used on our products in some cases and refers to important information in the Operators Manual. Make sure that warning and information symbols on the engine are clearly visible and legible. Replace symbols that have been damaged or painted over.

D4 and D6

P0004780

Electric welding**IMPORTANT!**

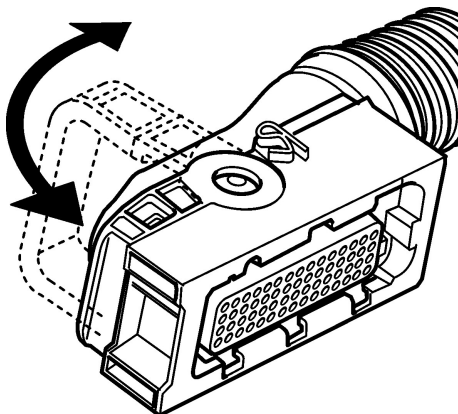
Before electric welding is begun, the following must be removed:

- engine control unit connector
- PCU connector

Remove the connector from the control unit

- 1 Press down/turn up the locking arm.
- 2 Pull the connector out.

Reconnect the engine control unit connector **after** welding equipment has been disconnected.

D11 and D13

P0004781

Set out below is a summary of the risks and safety measures that must be considered or carried out when the EVC system is installed and calibrated.



WARNING!

Working with or approaching a running engine is a safety risk. Watch out for rotating components and hot surfaces.



WARNING!

Never carry out work on an engine suspended on a hoist.



WARNING!

Only start the engine in a well-ventilated area. If operating the engine in a closed area ensure that there is exhaust ventilation leading out of the work area to remove exhaust gases and crankcase ventilation emissions.



WARNING!

Risk of fire and explosion. Never allow an open flame or electric sparks near the battery or batteries.



WARNING!

Explosion hazard. Batteries contain and give off an explosive gas which is highly flammable and explosive. A short circuit, open flame or spark could cause a violent explosion. Ventilate well.



WARNING!

Never confuse the positive and negative poles on the batteries. Risk of arcing and explosion.



WARNING!

Do not touch the connections during the start attempt: Risk of arcing.

Do not bend over any of the batteries either.



WARNING!

The battery electrolyte contains extremely corrosive sulfuric acid. Protect your skin and clothes when charging or handling batteries.

Always use protective goggles and gloves. If battery electrolyte comes into contact with unprotected skin wash off immediately using plenty of water and soap. If battery acid comes in contact with the eyes, flush immediately with plenty of water and obtain medical assistance without delay.

IMPORTANT!

Make sure that the positive (+) and negative (-) battery cables are correctly connected to the corresponding battery terminals. Wrong connection may cause severe damage to electrical equipment. Refer to the wiring diagram in the engine operator's manual.

IMPORTANT!

AB Volvo Penta has developed and tested the entire EVC system and its components. However, components supplied from manufacturers other than Volvo Penta, or components incorrectly installed, may cause the system to work incorrectly. In such cases, Volvo Penta does not accept any liability.

General Information

About this installation manual

NOTICE! Check that you have the correct manual. If this is not the case, please see your Volvo Penta dealer.

This installation manual contains information necessary for the installation and testing of the Volvo Penta EVC system (Electronic Vessel Control).

Although it does not cover every conceivable installation the manual is based on many years' practical experience from installations around the entire world, and its contents are intended as recommendations and for guidance according to Volvo Penta standards. Detailed installation instructions are supplied with most accessory kits.

It may sometimes be necessary or desirable to depart from the recommended procedure; in such cases Volvo Penta will happily offer assistance in finding a solution for a particular installation.

Read the instruction manual carefully before installation is begun. An incorrect installation can cause personal injury, damage to property or the engine. Contact Volvo Penta if any work instruction or information in the installation manual is unclear.

The installation manual is intended for use by professionally qualified and skilled personnel. It is a prerequisite that those persons using the manual have fundamental knowledge of marine propulsion systems and are capable of carrying out the associated mechanical and electrical work.

It is the responsibility of the installer to ensure that installation works are carried out in a satisfactory manner, that the installation is in good operable condition, that approved materials and accessories are used and that the installation fulfills all applicable legislation and regulations.

Installation of electrical systems may only be carried out by authorized marine electricians.

Only components, cables and connectors etc. delivered or approved by the manufacturer may be used. The manufacturer will not accept any liability whatsoever if this condition is not met.

NOTICE! Volvo Penta continually improves its products and reserves the right to make changes. All the information in this manual is based on product specifications available at the time of publication. After this date all important product modifications that change installation methods will be communicated by service bulletin.

Installation

This installation manual is only intended for professional use and must be used together with the relevant operator's manual for the engine concerned; the operator's manual contains important information concerning safety and engine operation.

Great care must be taken when installing engines and associated components if these are to function faultlessly. Always make sure that the correct specifications, drawings and other data are available before work is begun. This makes correct planning and installation possible right from the start.

Volvo Penta takes no responsibility for damage to materials or injury to persons that may occur when installation instructions are not followed or where work is performed by persons lacking professional qualifications.

The fitter is responsible for ensuring that the system functions in accordance with this installation manual.

NOTICE! The work must be performed at a Volvo Penta service workshop, a boatyard, or other suitably equipped authorized workshop by personnel with appropriate qualifications and experience.

Plan the engine compartment so that it will be easy to perform routine service that involves replacing components.

Check the information in the engine service manual and original engineering drawings that include dimensions.

When installing engines, it is extremely important that no dirt or foreign objects enter the fuel, cooling, inlet or turbocharger systems, as this may cause faults to arise or the engine to seize. Systems must therefore be sealed. Clean pipes and hoses before they are connected to the engine. Only remove the protective caps from the engine when external systems are being connected.

Cables and cable harnesses

Maximum cable length

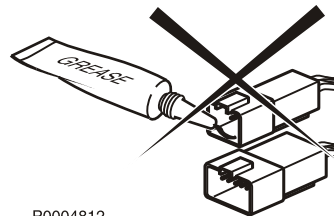
Multilink: 20 m (66 ft.) refers to one way.

Data link: Depends on the number of nodes in the system.

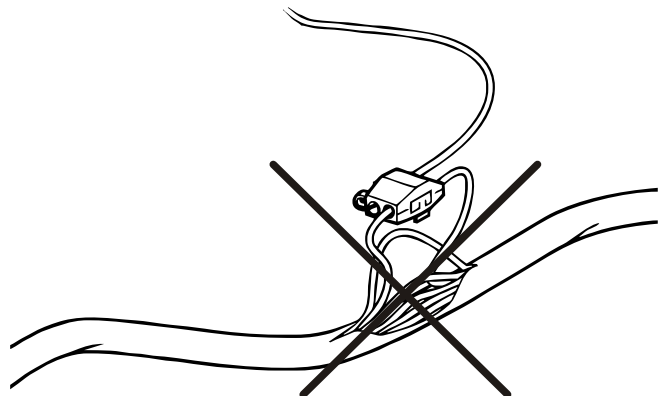
Aux-buss: 40 m (131 ft.) Refers to the same length between the nodes (components). There are terminal plugs at the beginnings and ends of the cable nodes.

IMPORTANT!

- Never use any type of grease in the EVC system connectors.
- Never cut or modify Volvo Penta EVC cables. Use Volvo Penta relays for electrical supply to accessories; refer to *Relay for external accessories* page 128.



P0004812



P0004872

IMPORTANT!

- It is extremely important to reduce cable load on the connectors. We therefore recommend that all cables be secured with cable ties to relieve them of strain.
- Always check that the locking mechanism between male and female connectors locks with a click. This guarantees correct water-tight closure.
- All cables must be installed at least 300 mm (12") away from other cables carrying radio frequencies or pulsed signals.

Certified Engines

A certified engine means that the engine manufacturer guarantees that not only new engines but also those in operation fulfill legislation and regulations. The product must be comparable to the engine that was approved at certification.

In order for Volvo Penta to certify that existing engines fulfill environmental legislation, the following must be observed during installation:

- Service to ignition timing, the valve system and fuel injection (gasoline) or injection pump, pump settings and injectors (diesel) must always be carried out by an authorized Volvo Penta workshop.
- The engine may not be modified in any way except with accessories and service kits developed for the purpose by Volvo Penta.
- The installation of exhaust pipes and air intakes (ventilation ducts) in the engine compartment must be carefully planned as their design may affect exhaust emissions.
- Seals may only be broken by authorized personnel.

IMPORTANT!

Use only genuine Volvo Penta parts. If non-Volvo Penta parts are used Volvo Penta will no longer accept any responsibility for the engine's fulfilling certification requirements.

Volvo Penta will not reimburse damages and costs arising from the use of non-Volvo Penta parts.

Mutual responsibility

Every engine comprises a large number of components working in unison. If one component deviates from its technical specification, it may cause a dramatic increase in the engine's environmental impact. It is therefore essential that any adjustable systems are correctly set and that genuine Volvo Penta parts are used.

Certain components may require specialist knowledge and special test equipment; e.g. fuel system components. For environmental reasons, some components are factory sealed. No work may be performed on sealed parts by unauthorized personnel.

Remember that most chemical products can harm the environment if they are used in the wrong manner. Volvo Penta recommends the use of biodegradable degreasing agents for cleaning engine components, unless the service manual states otherwise. When working on board take special care of oil and waste and hand it to a recycling station; oil must not be unintentionally pumped out into the environment along with bilge water.

Seaworthiness

The boat builder is responsible for checking that the boat fulfills safety requirements applicable in the market the boat is sold in. In the U.S.A. for example, "US Federal Regulations for pleasure boats" specify requirements. Requirements applicable in the EU are described below: Other markets: contact the competent authorities in the country concerned for information and detailed instructions regarding current safety requirements.

From June 16 1998, all leisure craft and certain associated equipment marketed and used within the EU must be provided with a CE label confirming fulfillment of safety requirements established by the European Parliament and European Commission in the Recreational Craft Directive. These normative standards are reflected in the standards established in support of the directive's objective regarding uniform safety requirements for leisure craft within the EU.

Authorized certification bodies allocate the right to use CE labels confirming that boats and equipment fulfill safety requirements. Classification societies in many member states have the status of authorized certification bodies for leisure craft, e.g. Lloyd's Register, Bureau Veritas, Registro Italiano Navale and Germanischer Lloyd, etc.

In many instances, entirely new certification institutions have been formed. The directive also allows boat and component manufacturers to affirm that the directive's requirements are fulfilled. The manufacturer must then archive the prescribed product information in such a way that the supervisory authority is able to review the documentation at least ten years after the final example of the product is manufactured.

Lifeboats and boats used in commercial navigation are approved by classification societies and maritime safety authorities in the country where the boats are registered.

Metric Conversion Chart

Metric to American or UK units:

	To convert		Multiply with
	From	To	
Length	mm	in.	0.03937
	cm	in.	0.3937
	m	ft.	3.2808
Area	mm ²	sq. in.	0.00155
	m ²	sq.ft.	10.76
Volume	cm ³	cu. in.	0.06102
	l, dm ³	cu. ft.	0.03531
	l, dm ³	cu. in.	61.023
	l, dm ³	imp. gallon	0.220
	l, dm ³	U.S. gallon	0.2642
	m ³	cu. ft.	35.315
Power	N	lbf	0.2248
Weight kg	kg	lb.	2.205
Power	kW	hp (metric) ⁽¹⁾	1.36
	kW	bhp	1.341
	kW	BTU/min	56.87
Tightening torque	Nm	lbf ft	0.738
Pressure	Bar	psi	14.5038
	MPa	psi	145.038
	Pa	mm Wg	0.102
	Pa	in Wg	0.004
	kPa	in Wg	4.0
	mWg	in Wg	39.37
Energy	kJ/kWh	BTU/hph	0.697
Effort	kJ/kg	BTU/lb	0.430
	MJ/kg	BTU/lb	430
	kJ/kg	kcal/kg	0.239
Fuel cons.	g/kWh	g/hph	0.736
	g/kWh	lb/hph	0.00162
Moment of inertia	kgm ²	lbft ²	23.734
Flow, gas	m ³ /h	cu.ft./min.	0.5886
Flow, fluid	m ³ /h	US gal/min	4.403
Speed	m/s	ft./s	3.281
	mph	knots	0.869
Temperature	Celsius	Fahrenheit	°F=9/5 x °C +32

American or UK to metric units:

	To convert		Multiply with
	From	To	
	in.	mm	25.40
	in.	cm	2.540
	ft.	m	0.3048
	sq. in.	mm ²	645.3
	sq. ft.	m ²	0.093
	cu. in.	cm ³	16.388
	cu. ft.	l, dm ³	28.317
	cu. in.	l, dm ³	0.01639
	imp. gallon	l, dm ³	4.545
	U.S. gallon	l, dm ³	3.785
	cu. ft.	cm ³	0.0283
	lbf	N	4.448
	lb.	kg	0.454
	hp (metric) ⁽¹⁾	kW	0.735
	bhp	kW	0.7457
	BTU/min	kW	0.0176
	lbf ft	Nm	1.356
	psi	Bar	0.06895
	psi	MPa	0.006895
	mm Wg	Pa	9.807
	in Wg	Pa	249.098
	in Wg	kPa	0.24908
	in Wg	mWg	0.0254
	BTU/hph	kJ/kWh	1.435
	BTU/lb	kJ/kg	2.326
	BTU/lb	MJ/kg	0.00233
	kcal/kg	kJ/kg	4.184
	g/hph	g/kWh	1.36
	lb/hph	g/kWh	616.78
	lbft ²	kgm ²	0.042
	cu.ft./min.	m ³ /h	1.699
	US gal/min	m ³ /h	0.2271
	ft./s	m/s	0.3048
	knots	mph	1.1508
	Fahrenheit	Celsius	°C=5/9 x (°F–32)

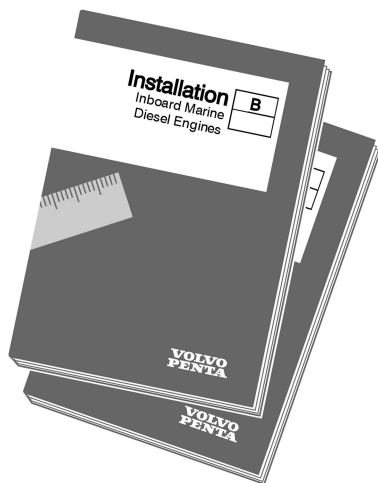
1) All catalog output data specified in horsepower refers to metric horsepower.

Installation Tools and Documentation

Publications

Installation manuals

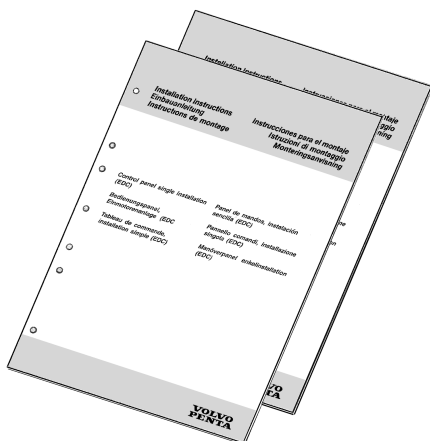
- Installation Volvo Penta IPS D4, D6
- Installation Volvo Penta IPS 650, 800, 950
- Installation Volvo Penta IPS 1050, 1200



P00004538

Installation instructions

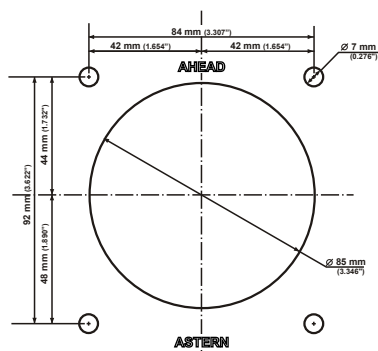
There are installation instructions included with most kits.



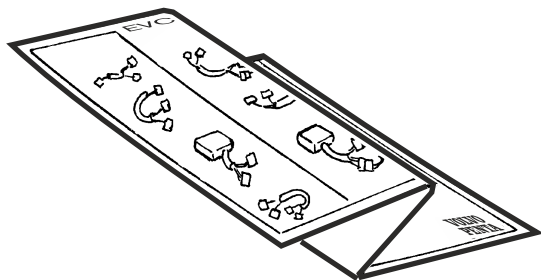
P00004539

Templates for panels and controls

Templates are included with each kit.



P0013796



P00004540

EVC-E Installation Poster publ. #

- 47702212: EVC-E Installation Procedure D4/D6
- 47702213: EVC-E Installation Procedure IPS Twin
- 47702214: EVC-E Installation Procedure IPS Triple
- 47702215: EVC-E Installation Procedure IPS Quad
- 47702216: EVC-E Installation Procedure Inboard D11/D13
- 47702217: EVC-E Installation Procedure Aquamatic D3–D6

EVC-E Calibration Poster publ. #

- 47702687: EVC-E Calibration and Settings IPS Twin
- 47702688: EVC-E Calibration and Settings IPS Triple
- 47702689: EVC-E Calibration and Settings IPS Quad
- 47702690: EVC-E Calibration and Settings D3–D13 Inboard
- 47702691: EVC-E Calibration and Settings D3–D6 Aquamatic

EVC-E2 Installation Poster publ. #

- 47705912: EVC-E2 Installation Procedure D4/D6 Aquamatic & Inboard
- 47705856: EVC-E2 Installation Procedure IPS Twin
- 47705857: EVC-E2 Installation Procedure IPS Triple
- 47705858: EVC-E2 Installation Procedure IPS Quad
- 47705913: EVC-E2 Installation Procedure D11/D13 Inboard
- 47705911: EVC-E2 Installation Procedure D3 Aquamatic & Inboard

EVC-E2 Calibration Booklet publ. #

- 47705854: EVC-E2 Calibration and Settings IPS
- 47705855: EVC-E2 Calibration and Settings Inboard
- 47705929: EVC-E2 Calibration and Settings Aquamatic

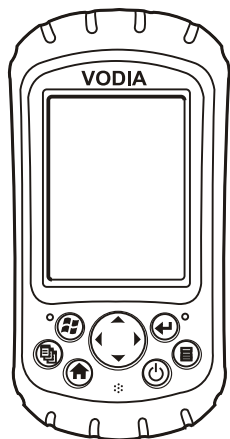
Volvo Penta Interceptor System (EVC-E2) Installation Poster publ. #

- 47703786: Installation instructions: Mounting plate for Interceptor System IS
The poster explains installation procedure for Mounting plate.

- 47702410: Installation instructions: Interceptor System IS

The Installation Instructions are referring to:

- 47703733: Installation, planning & instructions Interceptor System.



P0005180

VODIA diagnostic tool

VODIA is used for reading fault codes in clear text during diagnostic work. It can also be used for setting EVC parameters.

The tool is very practical for fault tracing as it is possible to see the values the EVC nodes are reading and transmitting.

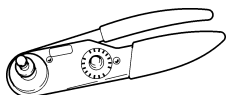
Refer to Volvo Penta Parter Network to order.

Special Tools



Engine harness tools

The following tools are not part of the Volvo Penta assortment, but must be ordered from **AMP** or **Deutsch** dealers.

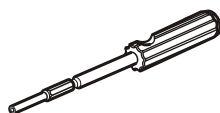


HDT-48-00

Deutsch connectors

HDT-48-00 Press tool

0411-310-1605 Removal tool

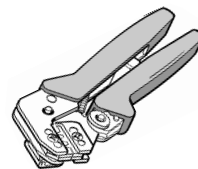


P0004548

725 840-1

16-pole CPC connector, d=1,6 mm

Removal tool

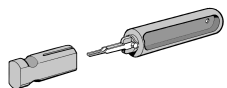


P0004549

58 495-1

16-pole CPC connector, d=1,6 mm

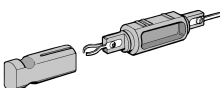
Press tool



726 534-1

JPT connector (42-pole EDC, 2 and 3-pole Bosch etc.)

Removal tool, 1.6 mm pin width



726 519-1

JPT connector (42-pole EDC, 2 and 3-pole Bosch etc.)

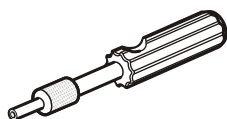
Removal tool, 2.8 mm pin width



825 514-1

JPT connector (42-pole EDC, 2 and 3-pole Bosch etc.)

Press tool



P0004550

725 9380

3.5 mm male and female

Removal tool



825 582-2

3.5 mm male and female

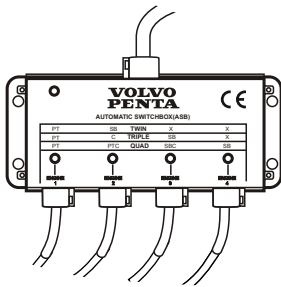
Press tool



825 514-1

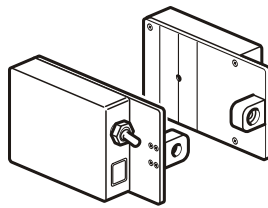
4.8 mm and 6.3 mm cable ter- minals, flat pin terminals

Press tool



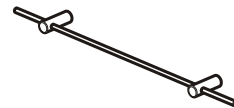
21287382 Break-out box

Used together with the VODIA tool; four connections



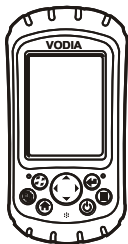
21406897 Calibration tool

Laser tool. Used when calibrating IPS drives



3808507 Calibration tool

Used when calibrating IPS drives



3838619 VODIA, diagnostic tool

Shows fault codes, logs EVC parameters and is used for calibrating IPS drive position



VODIA 5

PC-based diagnostics tool.

An internet connection is necessary for the download of software and central reporting. Connects to the engine for updates.

System Information

The EVC system is a so-called distributed system. Distributed systems consist of “smaller” electronic units called nodes located at suitable places in the boat.

The EVC nodes are the PCU (Power Train Control Unit), the IPS drive SUS (Servo Unit Steering) and the HCU (Helm Control Unit). The nodes are located close to the components they connect to.

The power train control unit is located in the engine compartment. The control unit is located in the IPS drive. The helm station control unit is located in the control or close to the helm station.

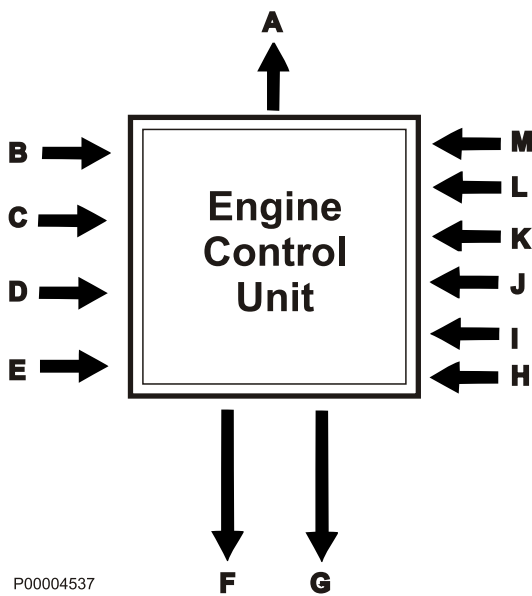
Each node is connected to a number of external components such as sensors, controls, instruments and control levers.

Each PCU and HCU is programmed for a specific engine. There are labels with serial numbers and chassis identities on each PCU and HCU. The serial number must correspond to the engine decal.

A CAN bus data link connects the nodes to each other. They combine to form a data network and the nodes exchange information and benefit from each others' services. Connecting all components to a network of nodes radically reduces cable runs. A CAN bus may be very long, but no longer than 40 meters in an EVC system.

CAN is an acronym for Controller Area Network, an industry standard for communication between nodes in a distributed system.

A distributed system allows the system architecture to be extended by adding extra equipment. New nodes can be connected to the network with minimal changes to the cables. Functionality becomes more effective since the nodes are allowed to collaborate and combine their resources to create a more useful and safer product.



Engine monitoring function

- A Diagnostics
- B Engine speed
- C Throttle
- D Oil pressure
- E Oil temperature
- F Injection timing
- G Fuel quantity
- H Camshaft position
- I Water in fuel
- J Fuel temperature
- K Boost temperature
- L Boost pressure
- M Coolant temperature

Overview

The engines are equipped with a common rail system and electronically controlled injectors (D4, D6) or injectors with electronic control units (D11, D13).

The injectors contain solenoid valves that control the quantity of injected fuel and the correct injection timing. The monitoring system measures boost pressure and temperature to calculate the mass of air available. It determines the maximum fuel quantity for injection (smoke limitation function).

The system also limits the maximum possible torque for a given engine speed to protect the engine and drive train against overloading.

In order to protect the engine in the case of excessive coolant and charge air temperatures and excessive boost and oil pressures, the monitoring system reduces fuel quantity (reduces engine power) until these values return to normal.

The engine monitoring system also has a diagnostic function that helps users and service technicians quickly determine the cause of any functional system faults with the help of a diagnostics lamp or diagnostics tool.

Any faults are shown as text in the displays and the VODIA diagnostics tool.

Features

Engine speed and gear shifting

Engine speed and gear shifting is controlled electronically. The reverse gear or sterndrive are protected against shifting at high rpm. The EVC system works with electronic control levers with a twin function, and for mechanical control levers with control adapters.

Additional helm stations

It is easy to install in up to seven helm stations (plug in). The EVC system provides different possibilities for transferring control between helm stations while in neutral or under way. There is a helm station locking function as a safety measure against unintended transfer of control.

Joystick

D3/D4/D6 Aquamatic with electronic steering

Maneuvering with the Volvo Penta IPS joystick is entirely intuitive. The helmsman presses or twists the joystick in the desired direction and the boat answers by moving ahead, astern, abeam or around its own vertical axis. The Volvo Penta IPS joystick uses the programmed synchronization of engines and drive units in order to berth the boat to where the helmsman wants.

Engine synchronizing

Engine synchronization provides improved comfort, good fuel economy and minimizes wear, thanks to reduced vibration and noise levels.

Trip computer

The EVC will support trip computer functions if the following are installed:

- multisensor or NMEA0183 / NMEA2000 compatible components (plotter, GPS, impeller etc.)
- fuel level sensor
- trip computer software. Order and download at the VODIA website.

Information from a trip computer can be shown in a 2.5", 4" or 7" display.

Trip data: Distance per liter, liters per unit of distance, fuel consumption over time, fuel consumption per trip, fuel consumption per trip and time, tank contents, trip time, trip distance, distance remaining until empty tank and time remaining until empty tank.

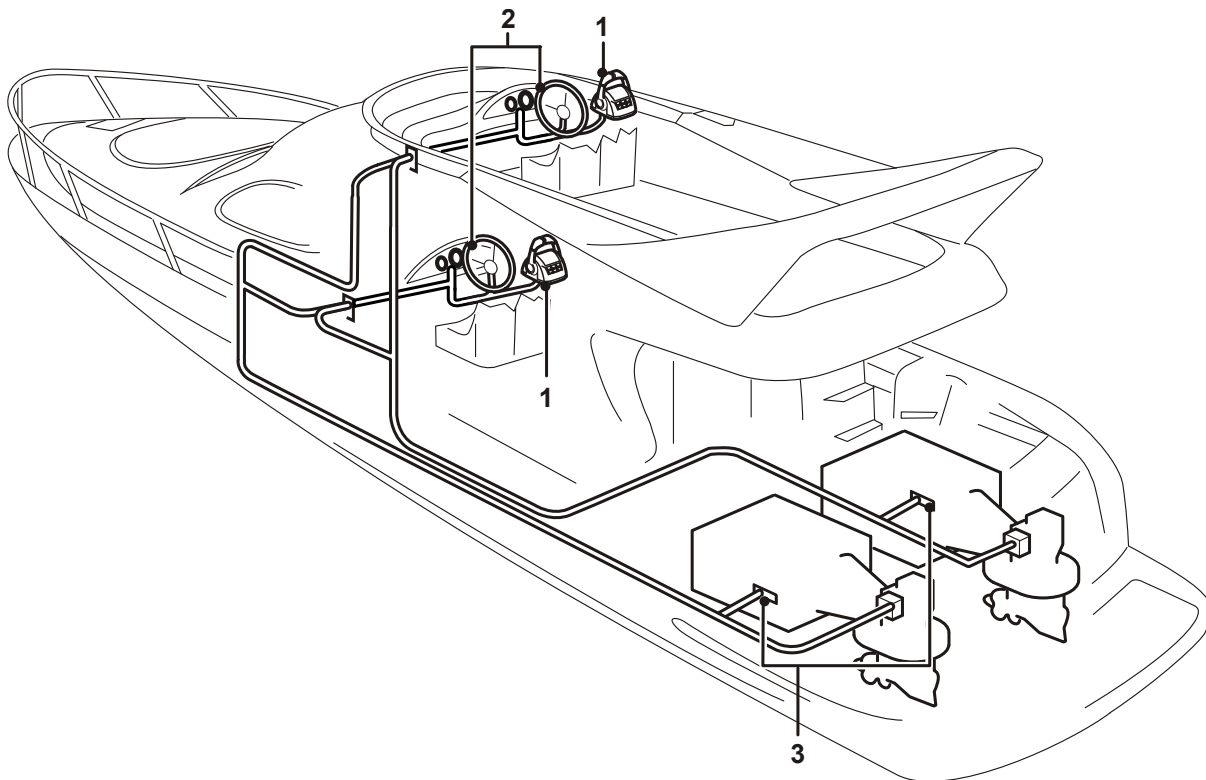
Volvo Penta Lowspeed function

Boats with powerful engines can be difficult to maneuver in confined waters, since they move at high speed even with engines idling. This problem is minimized with the use of the Volvo Penta Lowspeed function. The EVC system causes the reverse gear to troll hydraulically to provide a lower speed.

Depending on the type of reverse gear trolling may be achieved using a trolling valve or by controlling a primary or secondary solenoid valve. The reverse gear must also be fitted with an rpm sensor, a reluctor wheel on the output shaft and an oil pressure/temperature sensor.

Installation Examples

Example of EVC system in an IPS twin installation and two separate helm stations.



P0012833

- 1 Helm Control Unit (HCU) flybridge and main helm station.
- 2 Flybridge helm station and main helm station.
- 3 Drive line control unit (PCU).

47705916 05-2014 © AB VOLVO PENTA



Components shown in diagram

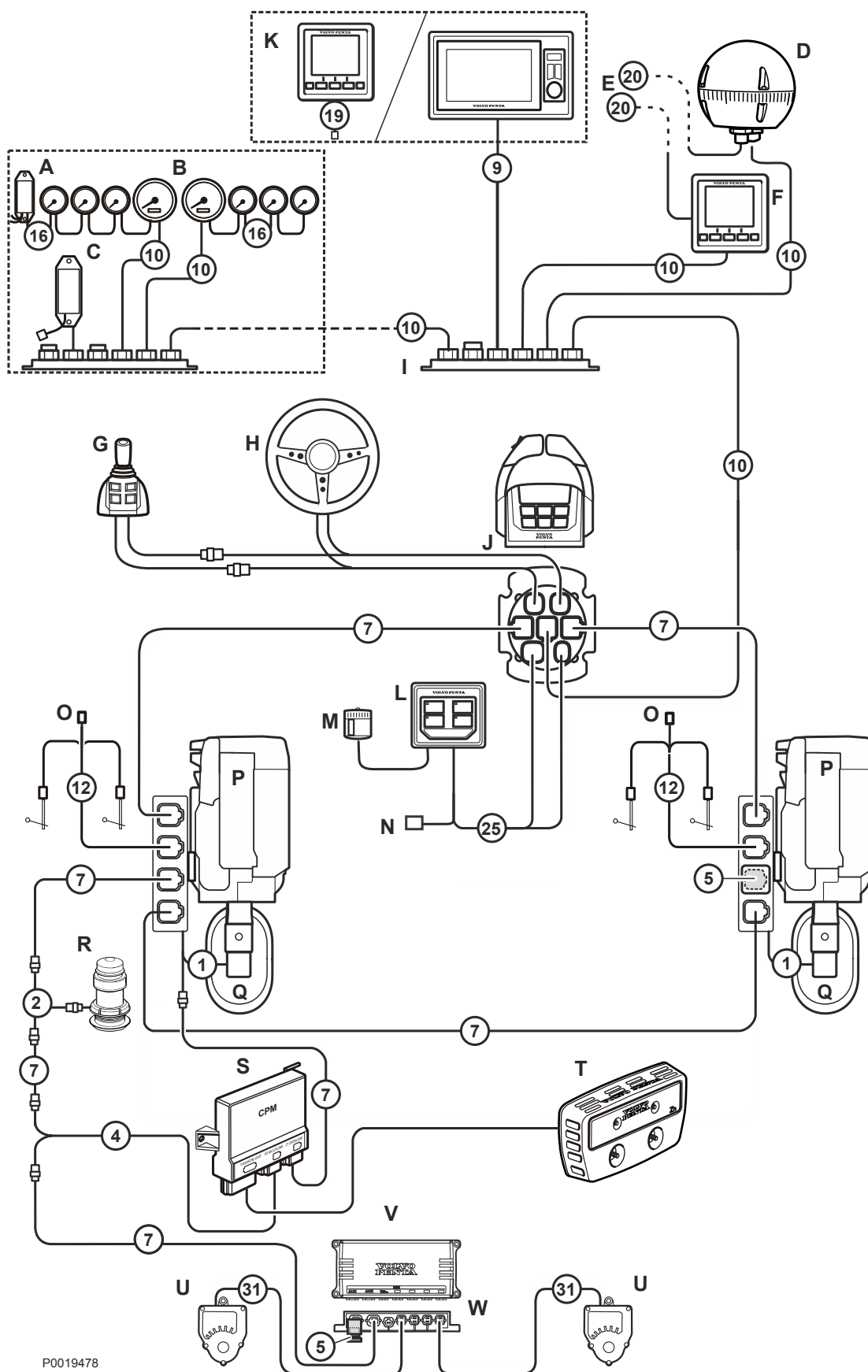
- A ADU
- B Instruments
- C NMEA interface
- D Compass (CCU)
- E To NMEA2000 backbone
- F Autopilot 4" display
- G Joystick
- H Steering Wheel
- I Multilink hub
- J Control/HCU connections
- K Multilink, minimum requirement
(Either 2 pcs 2.5" displays, 1 pcs 4" or 7" display)
- L e-Key panel
- M Buzzer
- N Connection for Safety lanyard
- O Rudder angle sensor (Not in use)
- P Engine
- Q SUS
- R Multisensor
- S CPM
- T ACP

Cables used in station

- 1. Transmission cable, IPS
- 2. Y-split Multisensor
- 4. Y-split CPM
- 5. Termination plug
- 7. Standard EVC bus cable, 6-pin
- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 12. Sensor cable, 6-pin
- 16. Extension cable, 3-pin
- 19. Display cable, 5/6 pin
- 20. NMEA2000 Extension cable
- 25. e-Key harness with Safety lanyard (option)

Twin installation

With Interceptor System



P0019478

Components shown in diagram

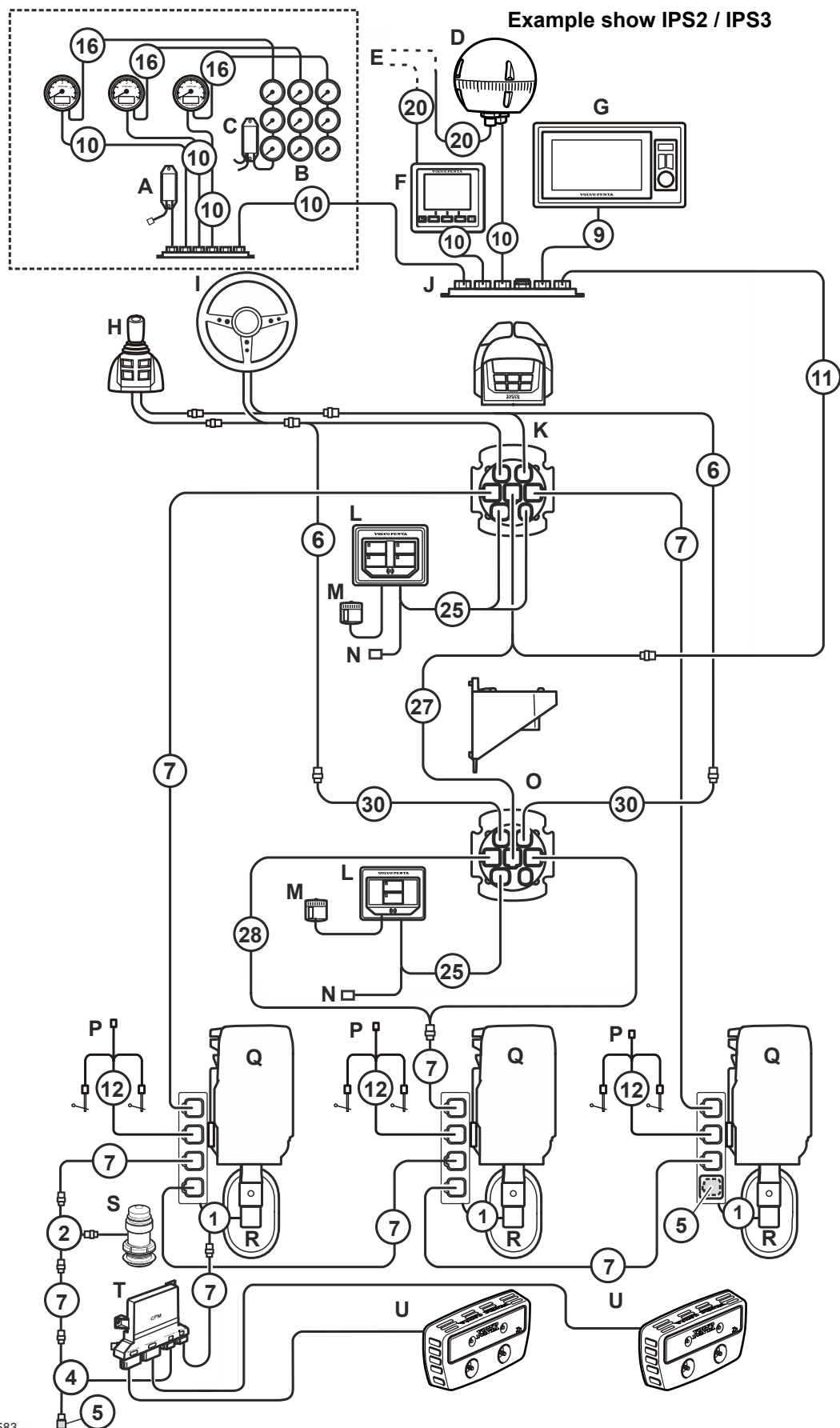
A ADU
B Instruments
C NMEA interface
D Compass (CCU)
E To NMEA2000 backbone
F Autopilot 4" display
G Joystick
H Steering Wheel
I Multilink hub
J Control/HCU connections
K Multilink, minimum requirement
(Either 1 pcs 4" or 1 pcs 7" display)
L e-Key panel
M Buzzer
N Connection for Safety lanyard
O Rudder angle sensor (Not in use)
P Engine
Q SUS
R Multisensor
S CPM
T ACP
U Interceptor servo module
V ICM, Interceptor Control Module
W Interceptor connection panel, color coded

Cables used in station

1. Transmission cable, IPS
2. Y-split Multisensor
4. Y-split CPM
5. Termination plug
7. Standard EVC bus cable, 6-pin
9. 7" Display cable, 6-pin
10. Multilink cable, 6-pin
12. Sensor cable, 6-pin
16. Extension cable, 3-pin
19. Display cable, 5/6 pin
20. NMEA2000 Extension cable
25. e-Key harness with Safety lanyard (option)
31. Interceptor system servo cable

Triple installation

Example show IPS2 / IPS3



P0019583

Components shown in diagram

A NMEA interface
 B Instruments
 C ADU
 D Compass (CCU)
 E To NMEA2000 backbone
 F Autopilot 4" display
 G 7" Display
 H Joystick
 I Steering Wheel
 J Multilink hub
 K Control/HCU connections
 L e-Key panel
 M Buzzer
 N Connection for Safety lanyard
 O Stand alone HCU
 P Rudder angle sensor(Not in use)
 Q Engine
 R SUS
 S Multisensor
 T CPM
 U ACP

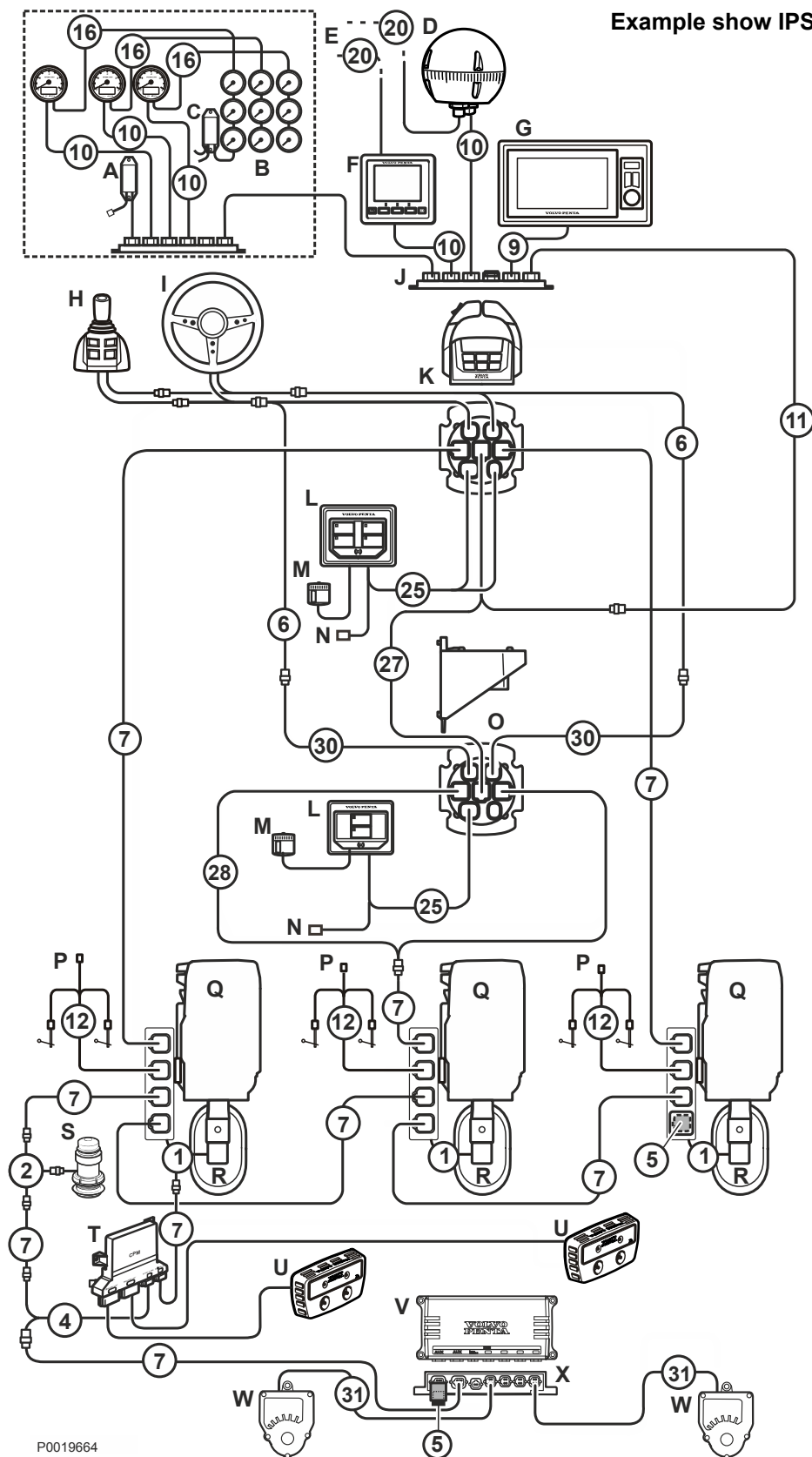
Cables used in station

1. Transmission cable, IPS
 2. Y-split Multisensor
 4. Y-split CPM
 5. Termination plug
 6. Y-split steering, 6-pin
 7. Standard EVC bus cable, 6-pin
 9. 7" Display cable, 6-pin
 10. Multilink cable, 6-pin
 11. Extension cable, 6-pin
 12. Sensor cable, 6-pin
 16. Extension cable, 3-pin
 20. NMEA2000 Extension cable
 25. e-Key harness with Safety lanyard (option)
 27. Y-split Hub Triple & Quad, 6-pin
 28. Y-split datalink, Triple installation, 6-pin
 30. Adapter cable, 6-pin

Triple installation

With Interceptor System

Example show IPS2 / IPS3



Components shown in diagram

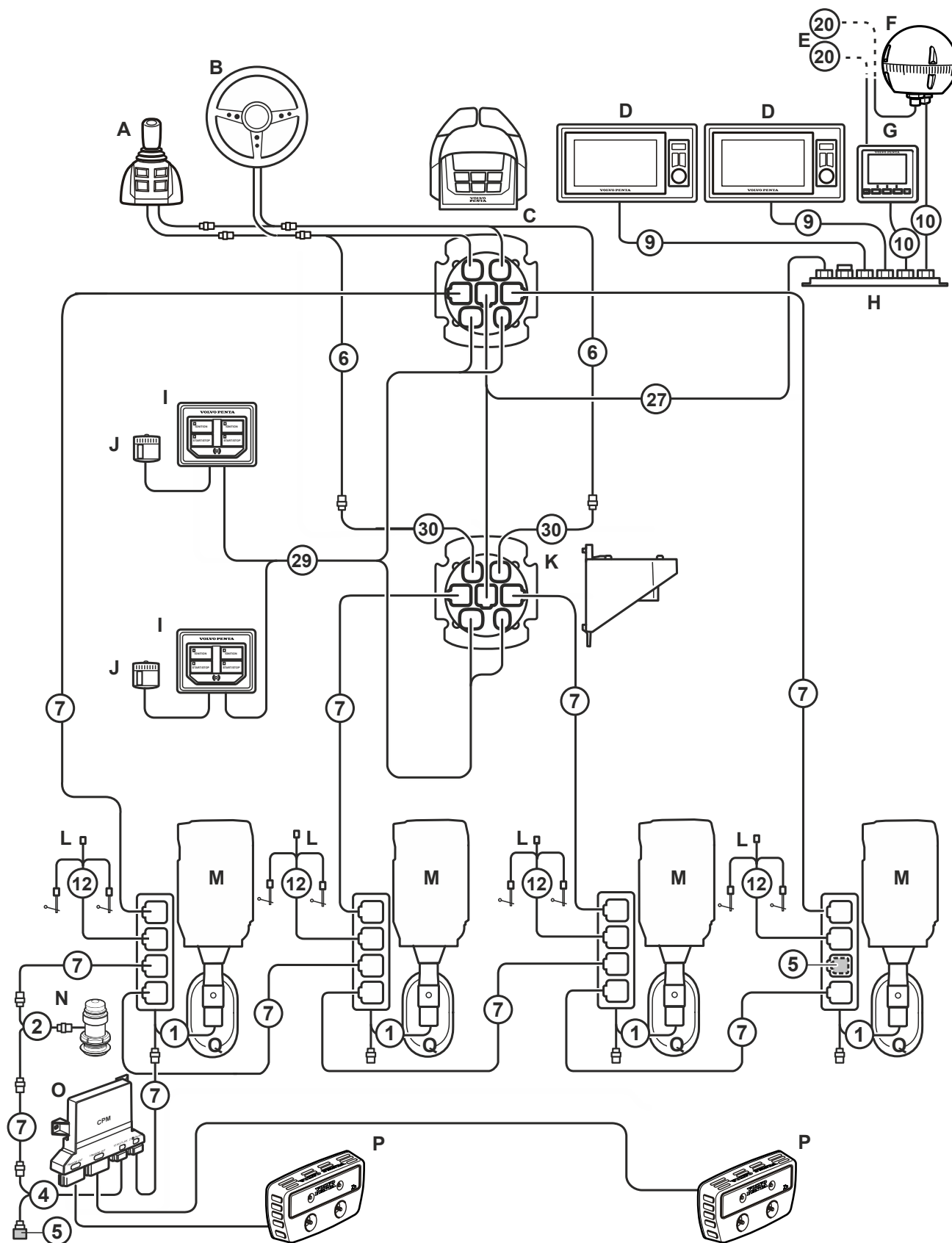
A NMEA interface
 B Instruments
 C ADU
 D Compass (CCU)
 E To NMEA2000 backbone
 F Autopilot 4" display
 G 7" Display
 H Joystick
 I Steering Wheel
 J Multilink hub
 K Control/HCU connections
 L e-Key panel
 M Buzzer
 N Connection for Safety lanyard
 O Stand alone HCU
 P Rudder angle sensor (Not in use)
 Q Engine
 R SUS
 S Multisensor
 T CPM
 U ACP
 V ICM, Interceptor Control Module
 W Interceptor servo module
 X Interceptor connection panel, color coded

Cables used in station

1. Transmission cable, IPS
 2. Y-split Multisensor
 4. Y-split CPM
 5. Termination plug
 6. Y-split steering, 6-pin
 7. Standard EVC bus cable, 6-pin
 9. 7" Display cable, 6-pin
 10. Multilink cable, 6-pin
 11. Extension cable, 6-pin
 12. Sensor cable, 6-pin
 16. Extension cable, 3-pin
 20. NMEA2000 Extension cable
 25. e-Key harness with Safety lanyard (option)
 27. Y-split Hub Triple & Quad, 6-pin
 28. Y-split datalink, Triple installation, 6-pin
 30. Adapter cable, 6-pin
 31. Interceptor system servo cable

Quad Installation

Example show IPS2 / IPS3



P0019584

Components shown in diagram

A Joystick
B Steering Wheel
C Control/HCU connections
D 7" Display
E To NMEA2000 backbone
F Compass (CCU)
G Autopilot 4" display
H Multilink hub
I e-Key panel
J Buzzer
K Stand alone HCU
L Rudder angle sensor (Not in use)
M Engine
N Multisensor
O CPM
P ACP
Q SUS

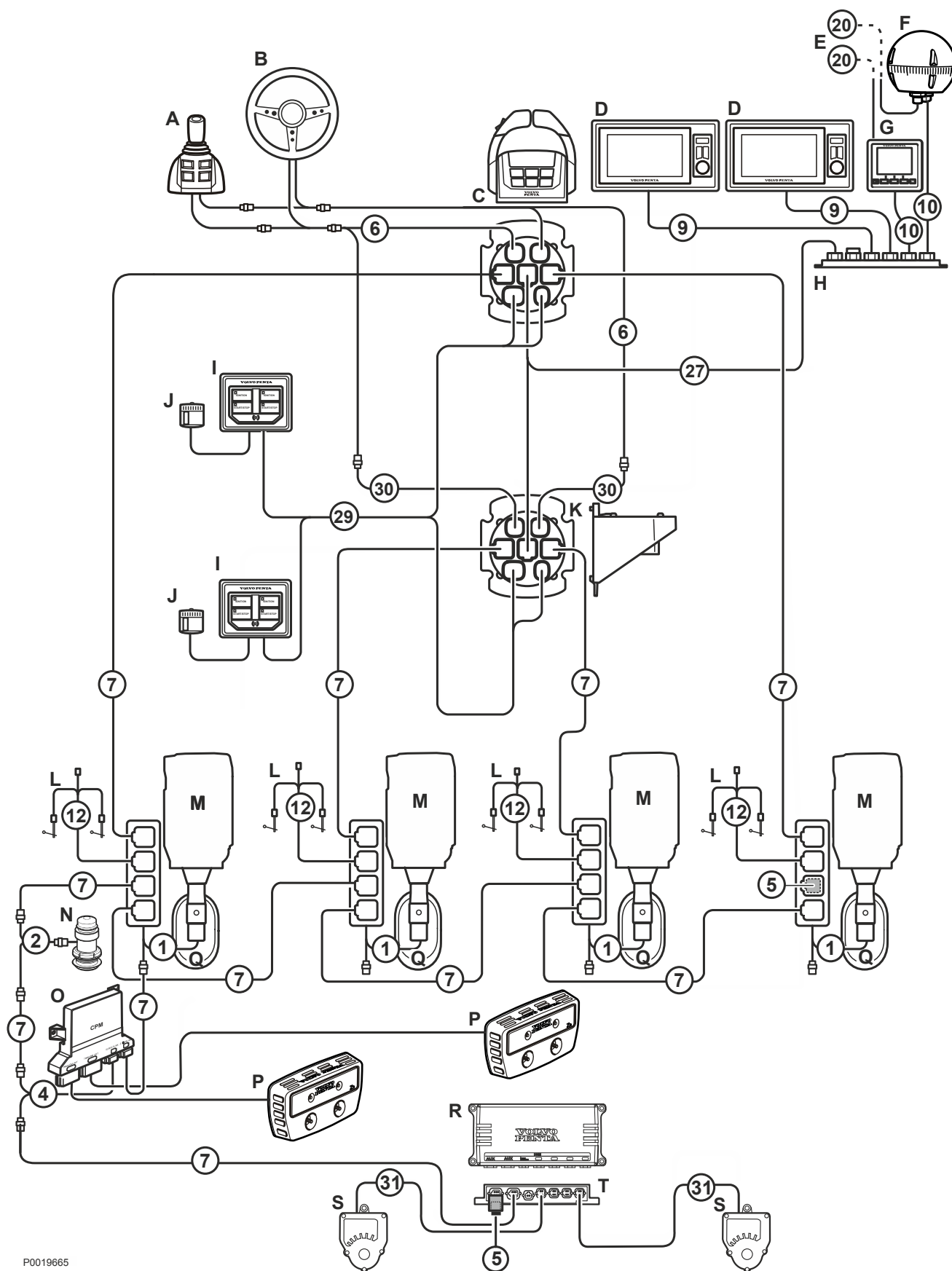
Cables used in station

1. Transmission cable, IPS
2. Y-split Multisensor
4. Y-split CPM
5. Termination plug
6. Y-split steering, 6-pin
7. Standard EVC bus cable, 6-pin
9. 7" Display cable, 6-pin
10. Multilink cable, 6-pin
12. Sensor cable, 6-pin
20. NMEA2000 Extension cable
27. Y-split Hub Triple & Quad, 6-pin
29. e-Key harness Quad
30. Adapter cable, 6-pin

Quad Installation

With Interceptor System

Example show IPS2 / IPS3



P0019665

Components shown in diagram

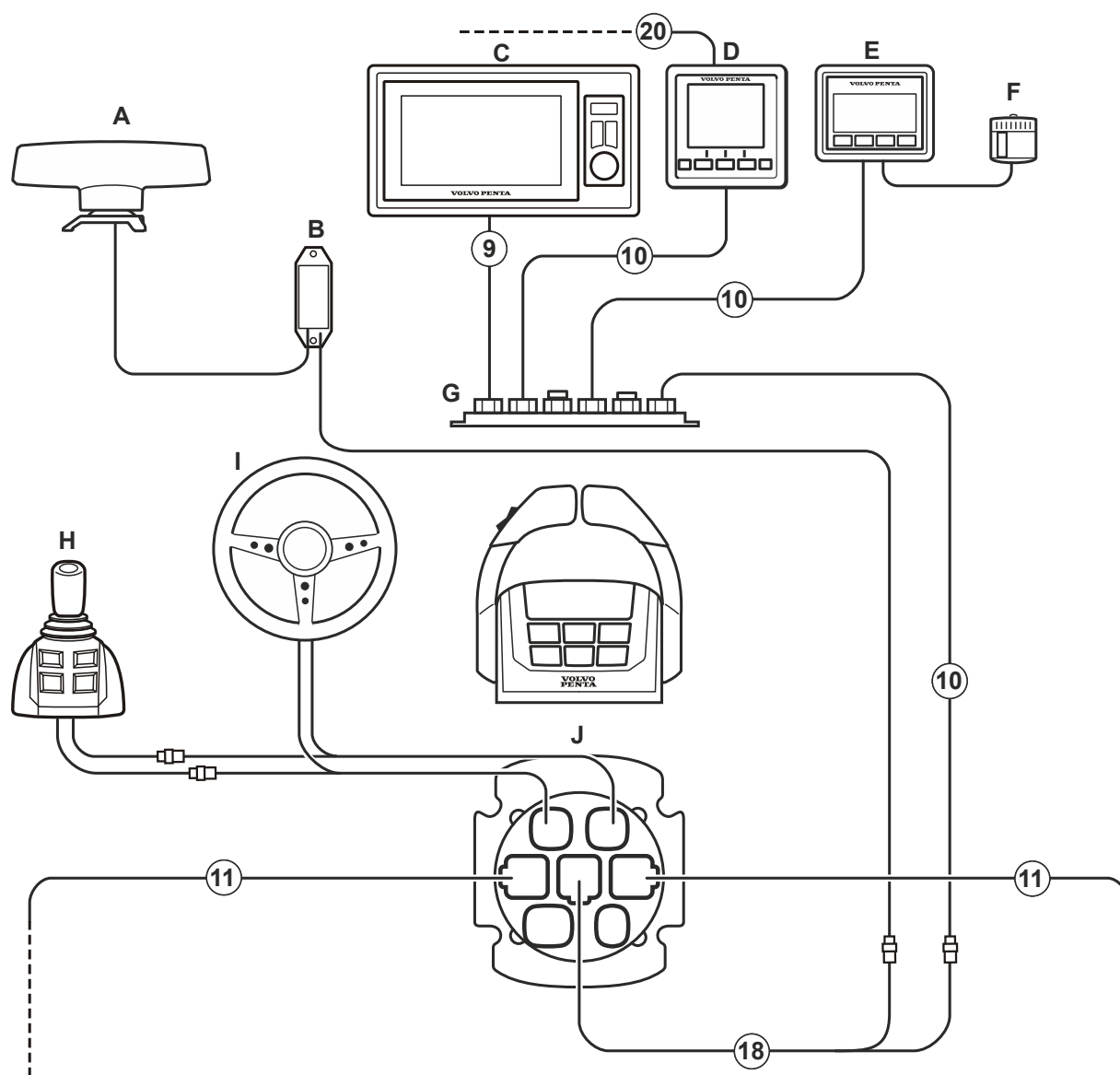
A Joystick
B Steering Wheel
C Control/HCU connections
D 7" Display
E To NMEA2000 backbone
F Compass (CCU)
G Autopilot 4" display
H Multilink hub
I e-Key panel
J Buzzer
K Stand alone HCU
L Rudder angle sensor (Not in use)
M Engine
N Multisensor
O CPM
P ACP
Q SUS
R ICM, Interceptor Control Module
S Interceptor servo module
T Interceptor connection panel, color coded

Cables used in station

1. Transmission cable, IPS
2. Y-split Multisensor
4. Y-split CPM
5. Termination plug
7. Standard EVC bus cable, 6-pin
9. 7" Display cable, 6-pin
10. Multilink cable, 6-pin
12. Sensor cable, 6-pin
20. NMEA2000 Extension cable
27. Y-split Hub Triple & Quad, 6-pin
29. e-Key harness Quad
30. Adapter cable, 6-pin
31. Interceptor system servo cable

Secondary helm station

Twin installation



P0019649

Components shown in diagram

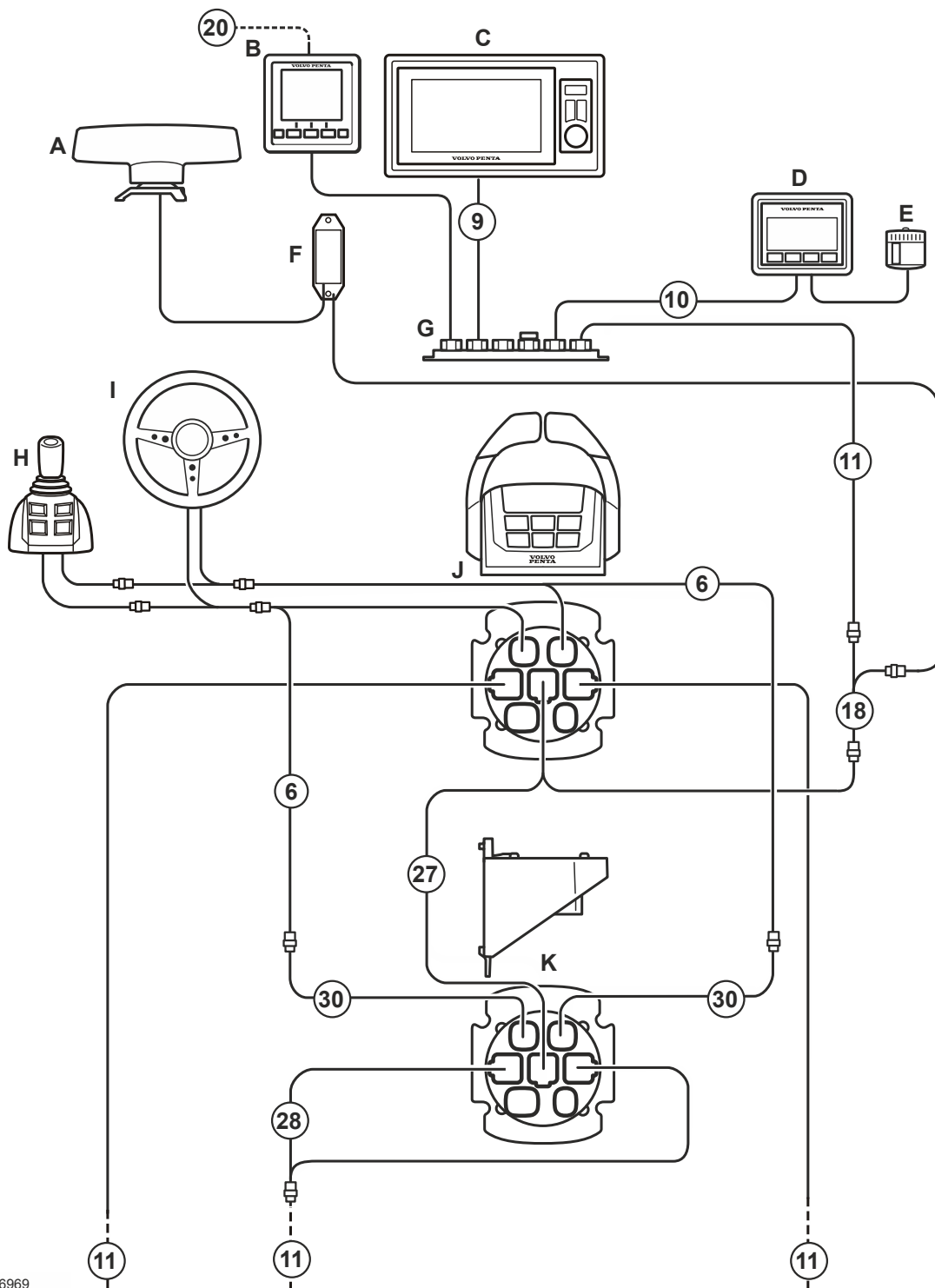
- A Dynamic Positioning System antenna
- B Dynamic Positioning System interface
- C 7" Display
- D Autopilot 4" display
- E Multifunction panel (Start/Stop panel)
- F Buzzer
- G Multilink hub
- H Joystick
- I Steering Wheel
- J Control/HCU connections

Cables used in station

- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 11. Extension cable, 6-pin
- 18. Y-split multilink, 6-pin
- 20. NMEA2000 Extension cable

Secondary helm station

Triple installation



P0016969

Components shown in diagram

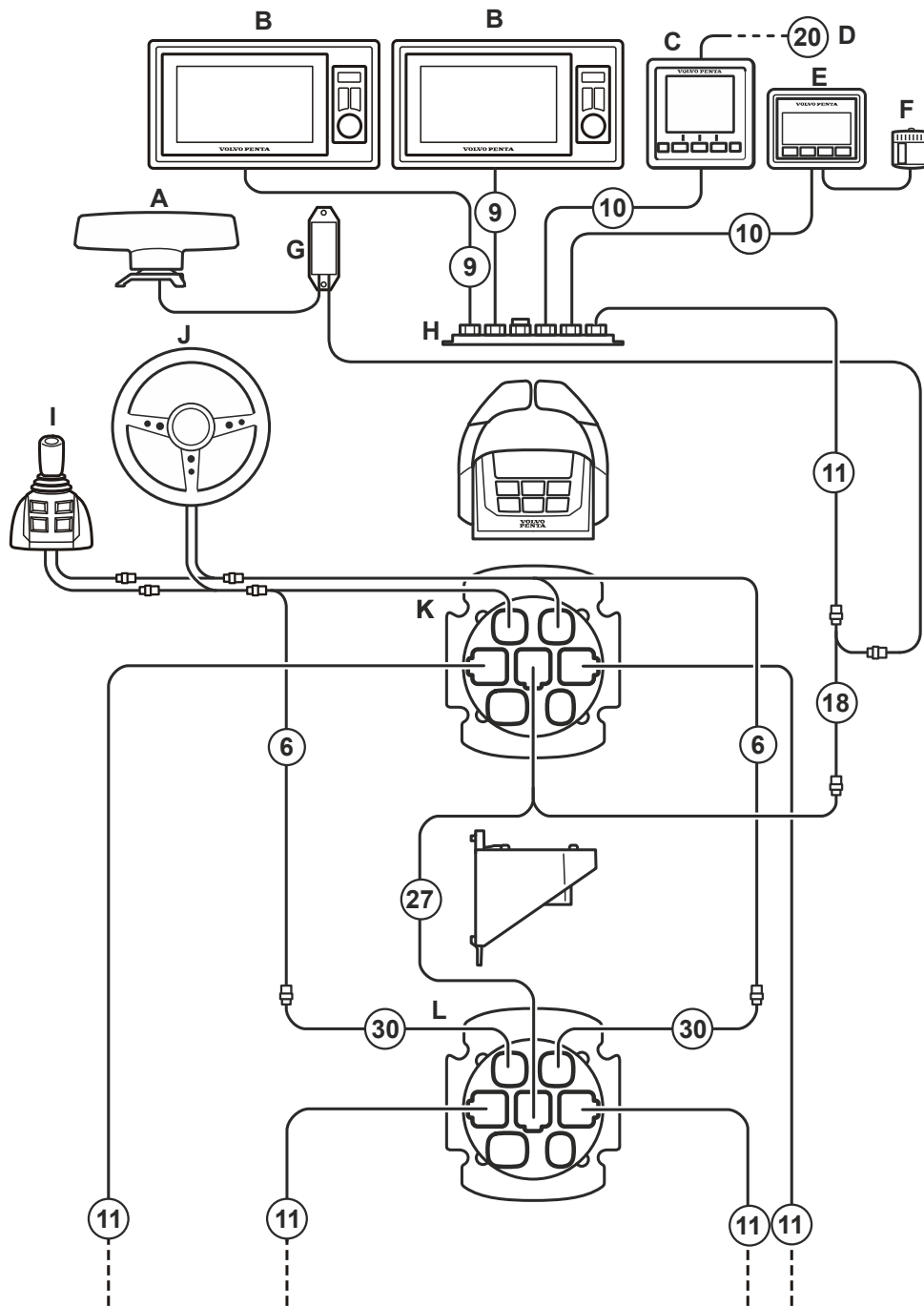
- A Dynamic Positioning System antenna
- B Autopilot 4" display
- C 7" Display
- D Multifunction panel (Start/Stop panel)
- E Buzzer
- F Dynamic Positioning System interface
- G Multilink hub
- H Joystick
- I Steering Wheel
- J Control/HCU connections
- K Stand alone HCU

Cables used in station

- 6. Y-split steering, 6-pin
- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 11. Extension cable, 6-pin
- 18. Y-split multilink, 6-pin
- 20. NMEA2000 Extension cable
- 27. Y-split Hub Triple & Quad, 6-pin
- 28. Y-split datalink, Triple installation, 6-pin
- 30. Adapter cable, 6-pin

Secondary helm station

Quad Installation



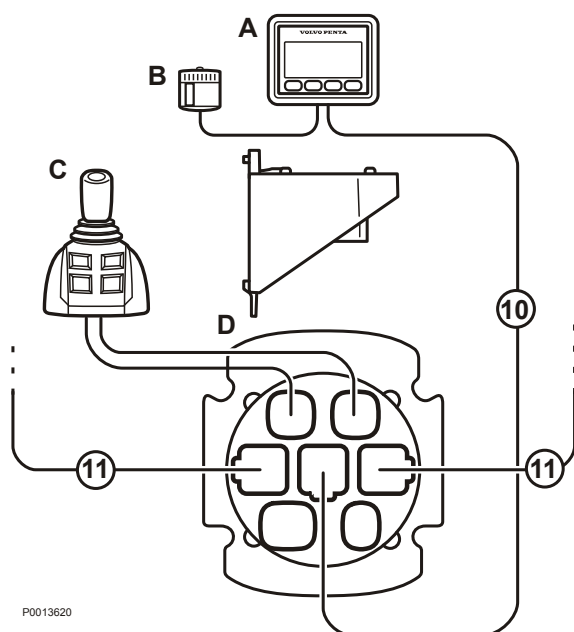
P0019668

Components shown in diagram

- A Dynamic Positioning System antenna
- B 7" Display
- C Autopilot 4" display
- D To NMEA2000 backbone
- E Multifunction panel (Start/Stop panel)
- F Buzzer
- G Dynamic Positioning System interface
- H Multilink hub
- I Joystick
- J Steering Wheel
- K Control/HCU connections
- L Stand alone HCU/Connections

Cables used in station

- 6. Y-split steering, 6-pin
- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 11. Extension cable, 6-pin
- 18. Y-split multilink, 6-pin
- 20. NMEA2000 Extension cable
- 27. Y-split Hub Triple & Quad, 6-pin
- 30. Adapter cable, 6-pin



P0013620

Dockingstation

Twin installation

Components shown in diagram

- A Multifunction panel (Docking station)
- B Buzzer
- C Joystick
- D Stand alone HCU/Connections

Cables used in station

- 10. Multilink cable, 6-pin
- 11. Extension cable, 6-pin

Dockingstation

Triple installation

Components shown in diagram

A Multifunction panel (Docking station)

B Buzzer

C Joystick

D Stand alone HCU/Connections

E Port Side

F Starboard Side

G Center

Cables used in station

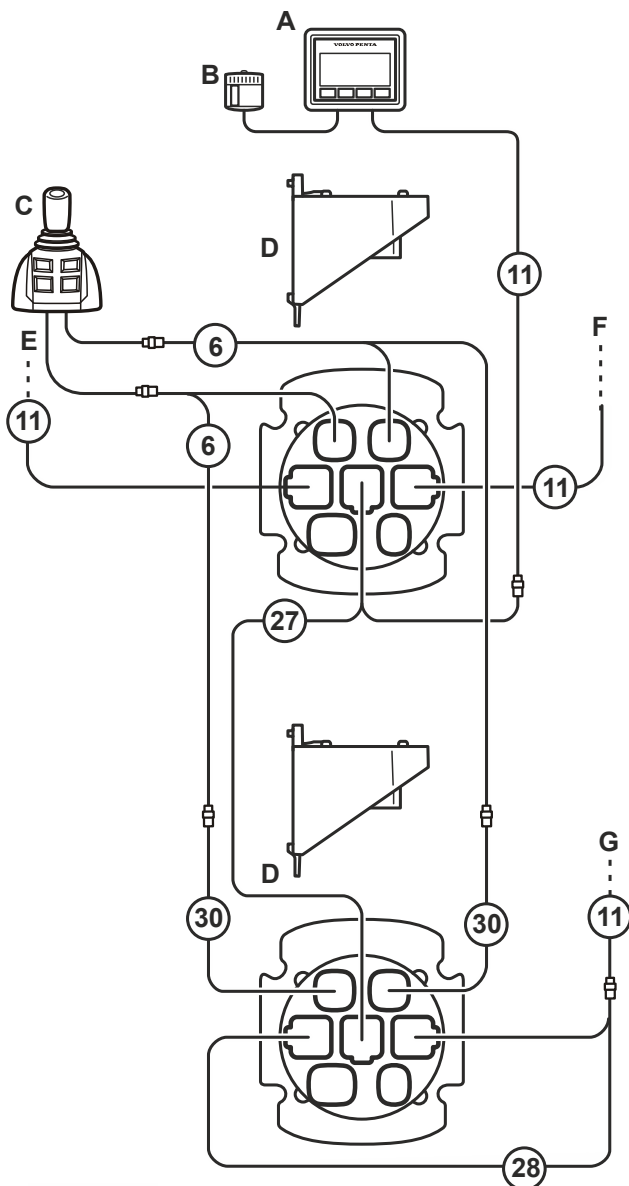
6. Y-split steering, 6-pin

11. Extension cable, 6-pin

27. Y-split Hub Triple & Quad, 6-pin

28. Y-split datalink, Triple installation, 6-pin

30. Adapter cable, 6-pin



P0016776

Quad Installation



Components shown in diagram

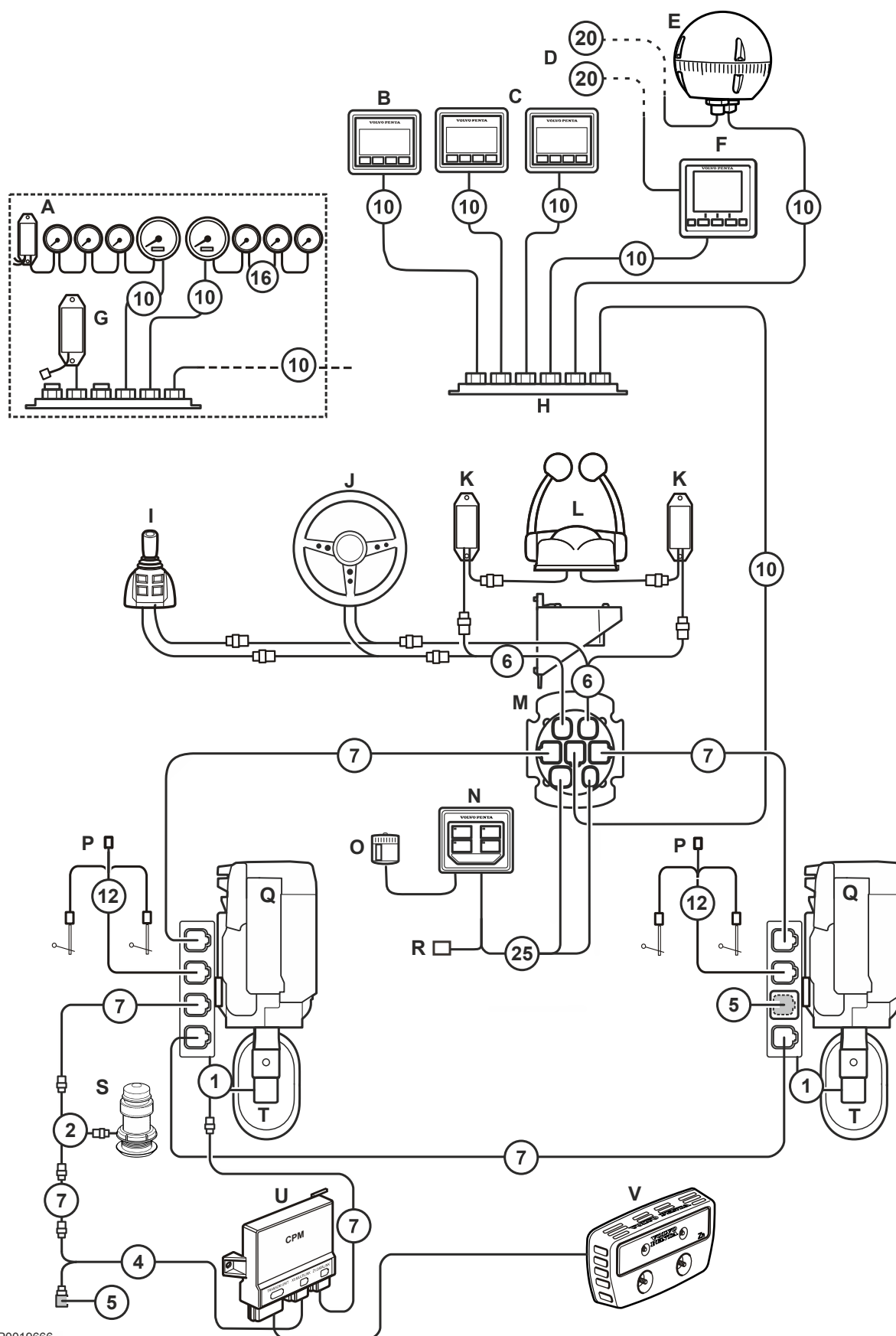
- A Joystick
- B Buzzer
- C Multifunction panel (Docking station)
- D Stand alone HCU/Connections

Cables used in station

- 6. Y-split steering, 6-pin
- 11. Extension cable, 6-pin
- 27. Y-split Hub Triple & Quad, 6-pin
- 30. Adapter cable, 6-pin

Main station with analog control

Twin installation



P0019666

Components shown in diagram

A ADU
 B Multifunction panel (Station panel)
 C 2.5" Display
 D To NMEA2000 backbone
 E Compass (CCU)
 F Autopilot 4" Display
 G NMEA2000 interface
 H Multilink hub
 I Joystick
 J Steering Wheel
 K Analog lever interface (A-CAN)
 L Controls
 M Stand alone HCU/Connections
 N e-Key panel
 O Buzzer
 P Rudder angle sensor (Not in use)
 Q Engine
 R Connection for Safety lanyard
 S Multisensor
 T SUS
 U CPM
 V ACP

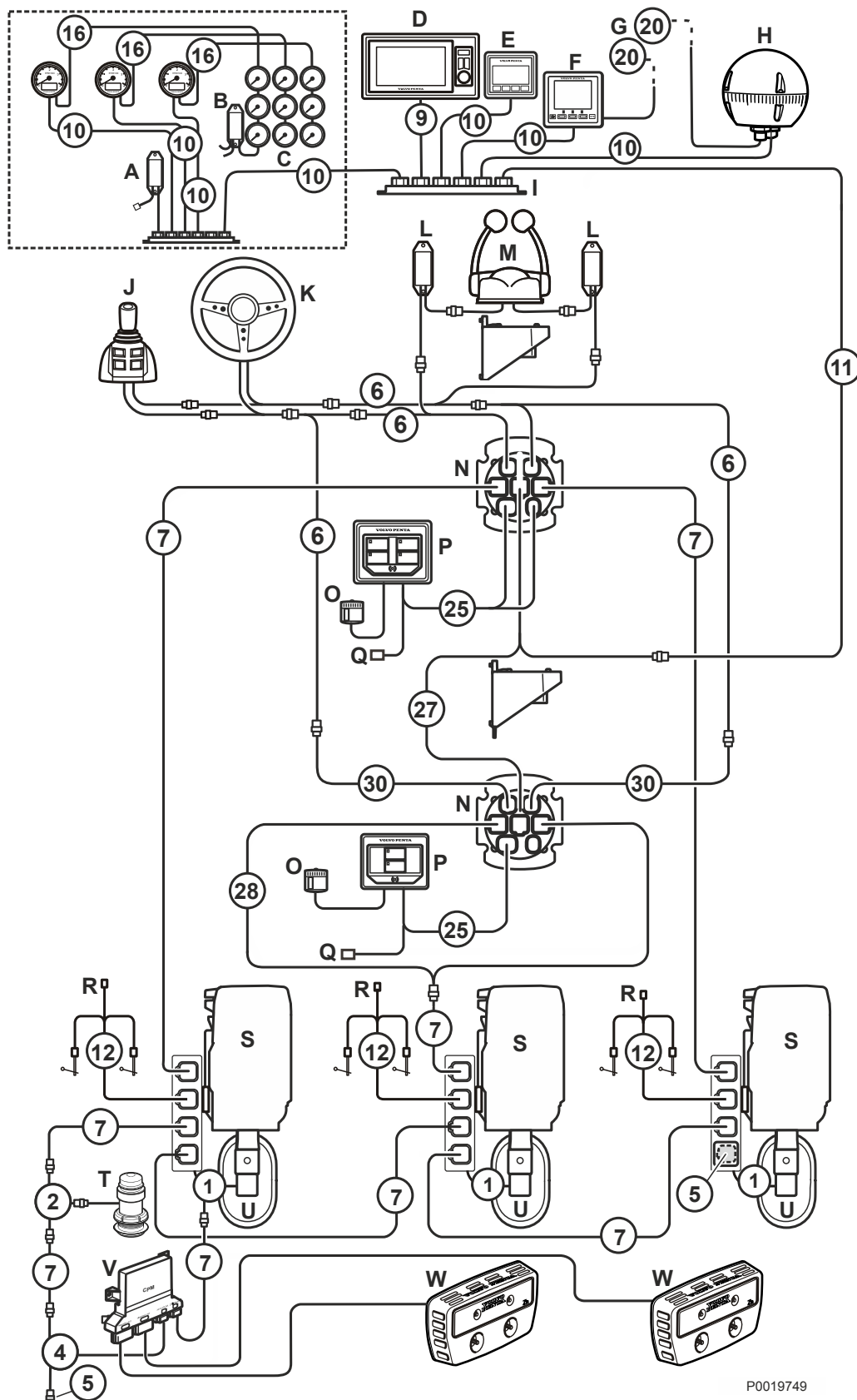
Cables used in station

1. Transmission cable, IPS
 2. Y-split Multisensor
 4. Y-split CPM
 5. Termination plug
 6. Y-split steering, 6-pin
 7. Standard EVC bus cable, 6-pin
 10. Multilink cable, 6-pin
 12. Sensor cable, 6-pin
 16. Extension cable, 3-pin
 20. NMEA2000 Extension cable
 25. e-Key harness with Safety lanyard (option)

Main station with analog control

Triple installation

Example show IPS2 / IPS3



P0019749

Components shown in diagram

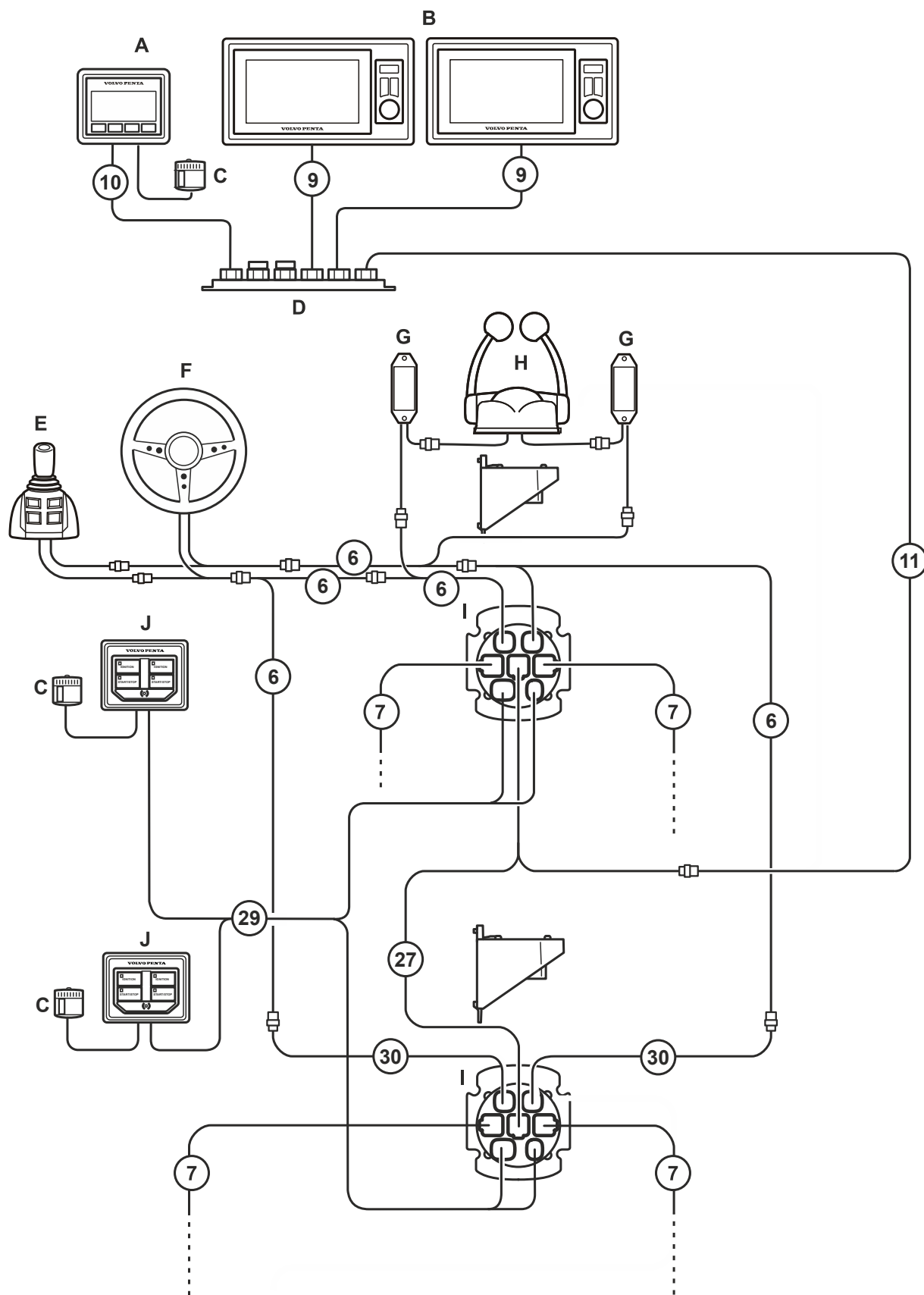
A NMEA interface
 B ADU
 C Gauges
 D 7" Display
 E Multifunction panel (Station panel)
 F Autopilot 4" display
 G To NMEA2000 backbone
 H Compass (CCU)
 I Multilink hub
 J Joystick
 K Steering Wheel
 L Analog lever interface (A-CAN)
 M Controls
 N Stand alone HCU/Connections
 O Buzzer
 P e-Key panel
 Q Connection for Safety lanyard
 R Rudder angle sensor (Not in use)
 S Engine
 T Multisensor
 U SUS
 V CPM
 W ACP

Cables used in station

1. Transmission cable, IPS
 2. Y-split Multisensor
 4. Y-split CPM
 5. Termination plug
 6. Y-split steering, 6-pin
 7. Standard EVC bus cable, 6-pin
 9. 7" Display cable, 6-pin
 10. Multilink cable, 6-pin
 11. Extension cable, 6-pin
 12. Sensor cable, 6-pin
 16. Extension cable, 3-pin
 20. NMEA2000 förlängningskabel
 25. e-Key harness with Safety lanyard (option)
 27. Y-split Hub Triple & Quad, 6-pin
 28. Y-split datalink, Triple installation, 6-pin
 30. Adapter cable, 6-pin

Main station with analog control

Quad Installation



P0019671

Components shown in diagram

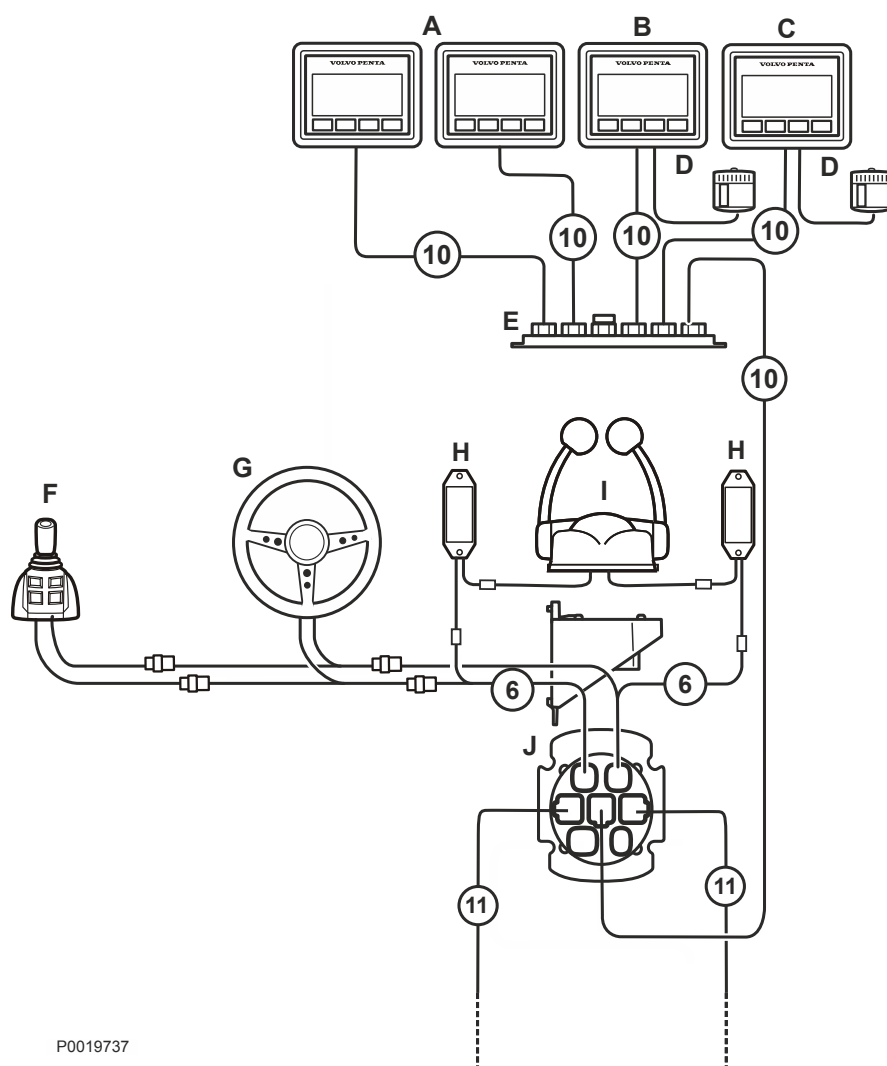
- A Multifunction panel (Station panel)
- B 7" Display
- C Buzzer
- D Multilink hub
- E Joystick
- F Steering Wheel
- G Analog lever interface (A-CAN)
- H Controls
- I Stand alone HCU/Connections
- J e-Key panel

Cables used in station

- 6. Y-split steering, 6-pin
- 7. Standard EVC bus cable, 6-pin
- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 11. Extension cable, 6-pin
- 27. Y-split Hub Triple & Quad, 6-pin
- 29. e-Key harness Quad
- 30. Adapter cable, 6-pin

Secondary station with analog control

Twin installation



P0019737

Components shown in diagram

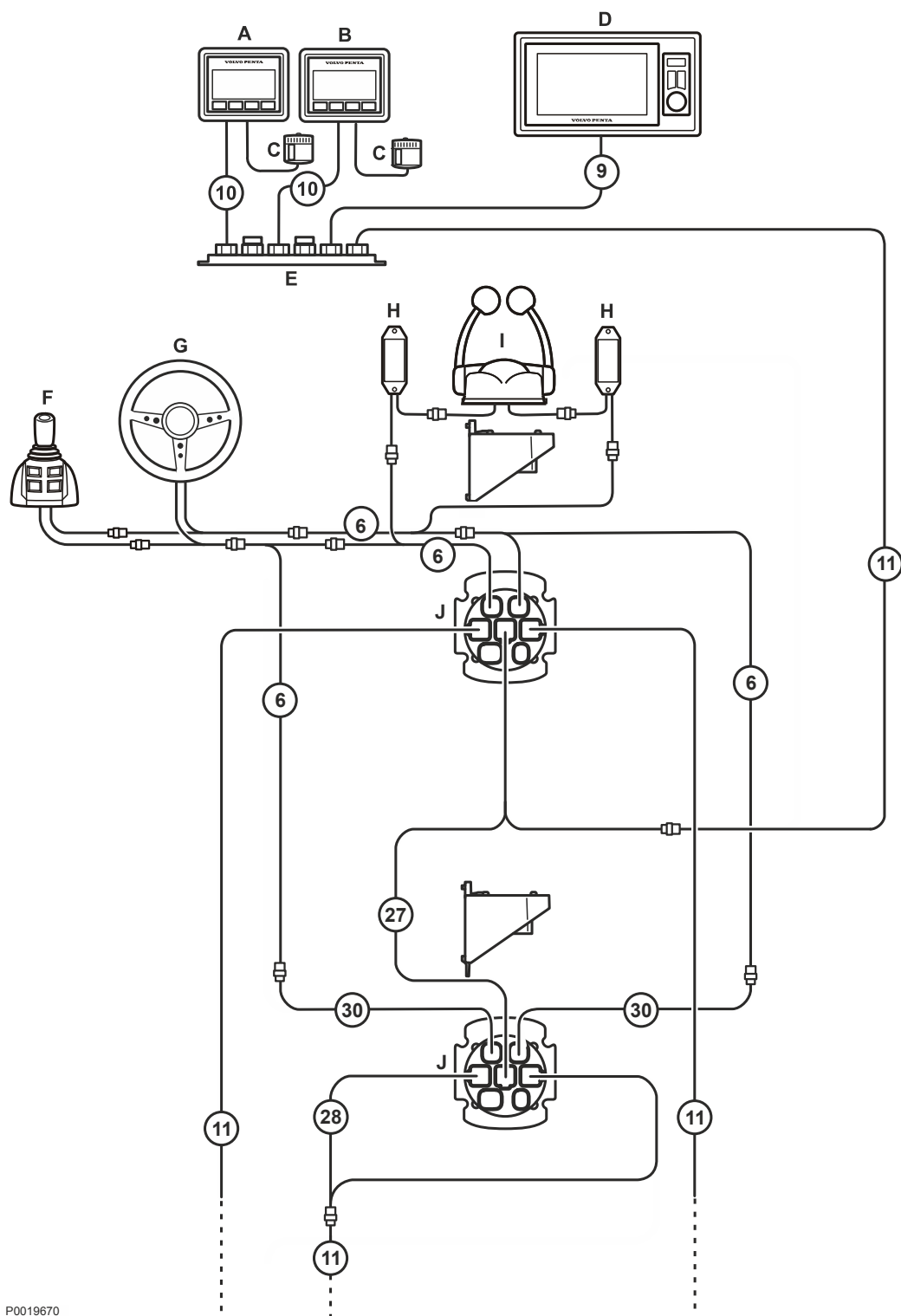
- A 2.5" Display
- B Multifunction panel (Start/Stop panel)
- C Multifunction panel (Station panel)
- D Buzzer
- E Multilink hub
- F Joystick
- G Steering Wheel
- H Analog lever interface (A-CAN)
- I Controls
- J Stand alone HCU/Connections

Kablar använda i stationen

- 6. Y-split steering, 6-pin
- 10. Multilink cable, 6-pin
- 11. Extension cable, 6-pin

Secondary station with analog control

Triple installation



P0019670

Components shown in diagram

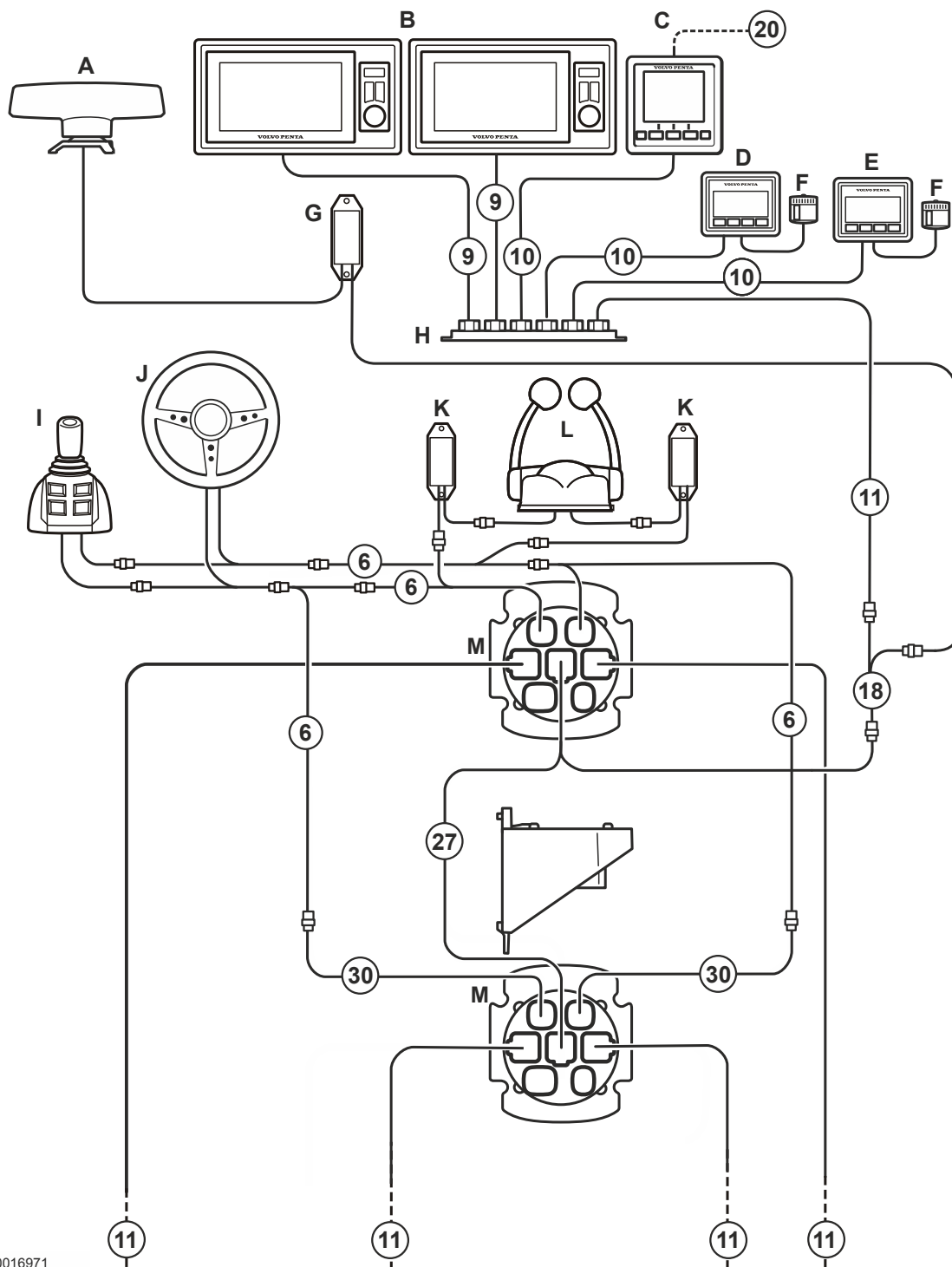
- A Multifunction panel (Station panel)
- B Multifunction panel (Start/Stop panel)
- C Buzzer
- D 7" Display
- E Multilink hub
- F Joystick
- G Steering Wheel
- H Analog lever interface (A-CAN)
- I Controls
- J Stand alone HCU/Connections

Cables used in station

- 6. Y-split steering, 6-pin
- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 11. Extension cable, 6-pin
- 27. Y-split Hub Triple & Quad, 6-pin
- 28. Y-split datalink, Triple installation, 6-pin
- 30. Adapter cable, 6-pin

Secondary station with analog control

Quad Installation



P0016971

Components shown in diagram

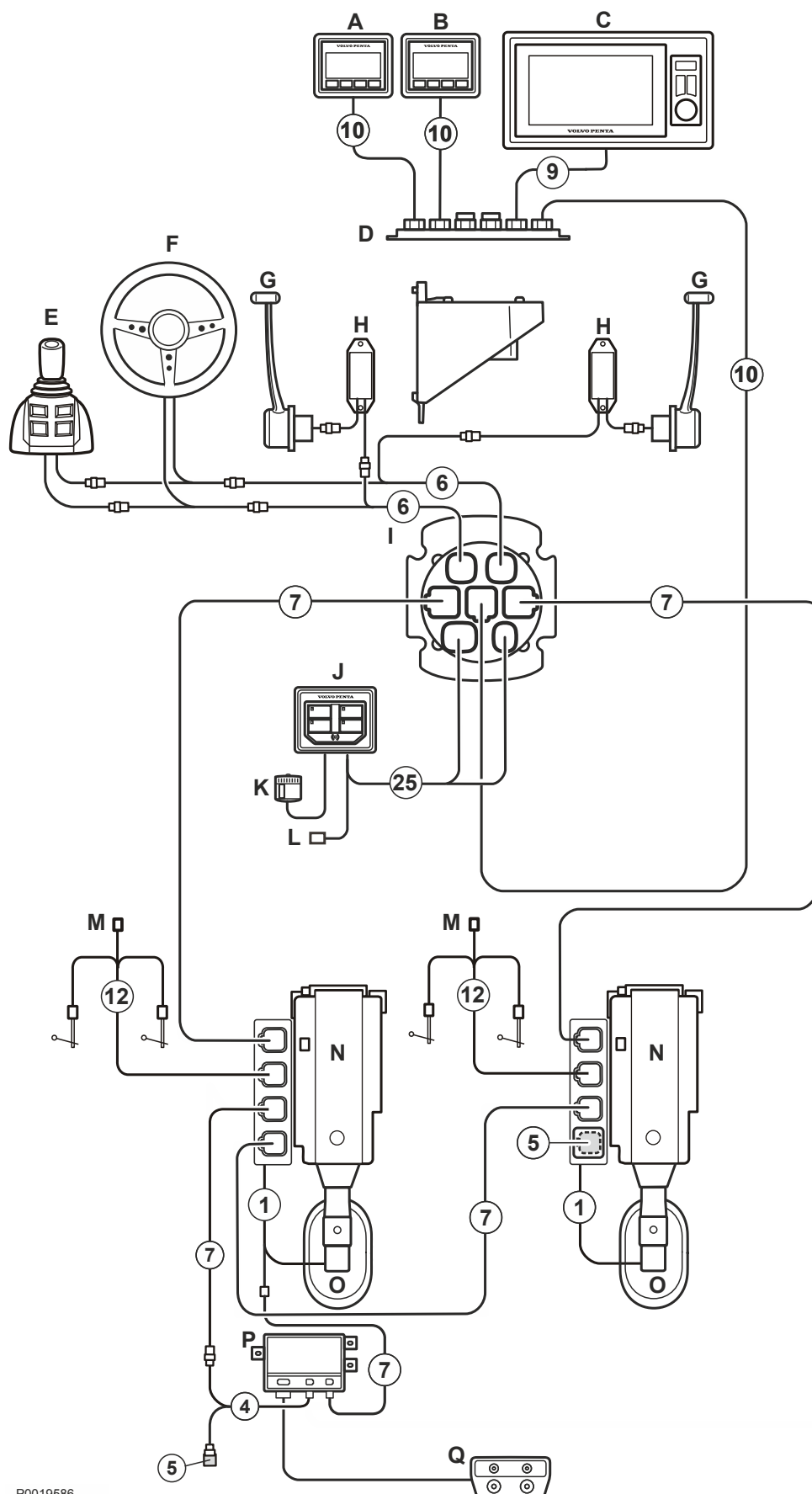
- A Dynamic Positioning System antenna
- B 7" Display
- C Autopilot 4" display
- D Multifunction panel (Start/Stop panel)
- E Multifunction panel (Station panel)
- F Buzzer
- G Dynamic Positioning System interface
- H Multilink hub
- I Joystick
- J Steering Wheel
- K Analog lever interface (A-CAN)
- L Controls
- M Stand alone HCU/Connections

Cables used in station

- 6. Y-split steering, 6-pin
- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 11. Extension cable, 6-pin
- 18. Y-split multilink, 6-pin
- 20. NMEA2000 Extension cable
- 27. Y-split Hub Triple & Quad, 6-pin
- 30. Adapter cable, 6-pin

Sportfish station

Twin installation



P0019586

Components shown in diagram

- A Multifunction panel (Sport fish panel)
- B Multifunction panel (Station panel)
- C 7" Display
- D Multilink hub
- E Joystick
- F Steering Wheel
- G Lever 'Palm Beach'
- H Analog lever interface (A-CAN)
- I Stand alone HCU/Connections
- J e-Key panel
- K Buzzer
- L Connection for Safety lanyard
- M Rudder angle sensor (Not in use)
- N Engine
- O SUS
- P CPM
- Q ACP

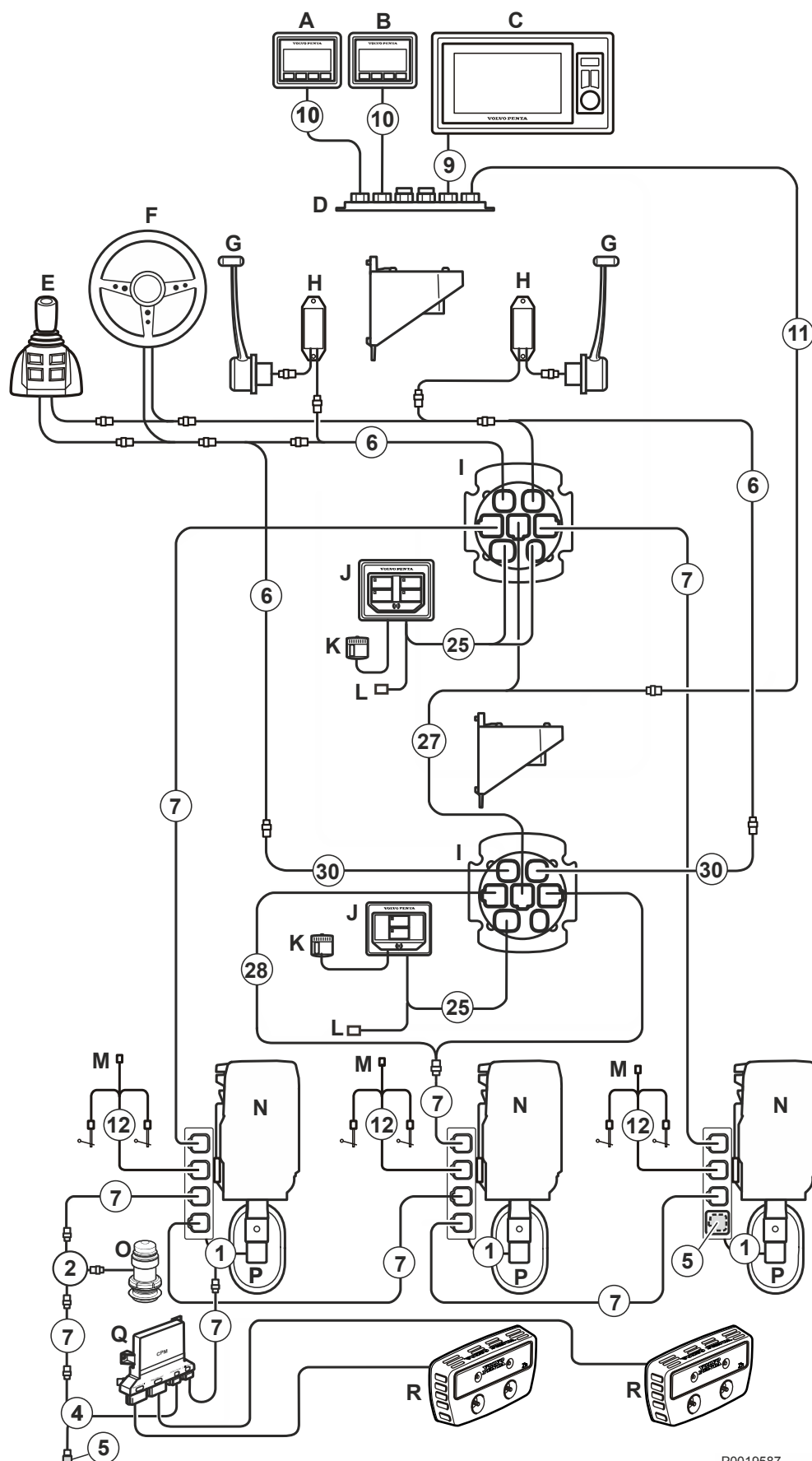
Cables used in station

- 1. Transmission cable, IPS
- 4. Y-split CPM
- 5. Termination plug
- 6. Y-split steering, 6-pin
- 7. Standard EVC bus cable, 6-pin
- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 12. Sensor cable, 6-pin
- 25. e-Key harness with Safety lanyard (option)

Sportfish station

Triple installation

Example show IPS2 / IPS3



P0019587

Components shown in diagram

- A Multifunction panel (Sport fish panel)
- B Multifunction panel (Station panel)
- C 7" Display
- D Multilink hub
- E Joystick
- F Steering Wheel
- G Lever 'Palm Beach'
- H Analog lever interface (A-CAN)
- I Stand alone HCU/Connections
- J e-Key panel
- K Buzzer
- L Connection for Safety lanyard
- M Rudder angle sensor (Not in use)
- N Engine
- O Multisensor
- P SUS
- Q CPM
- R ACP

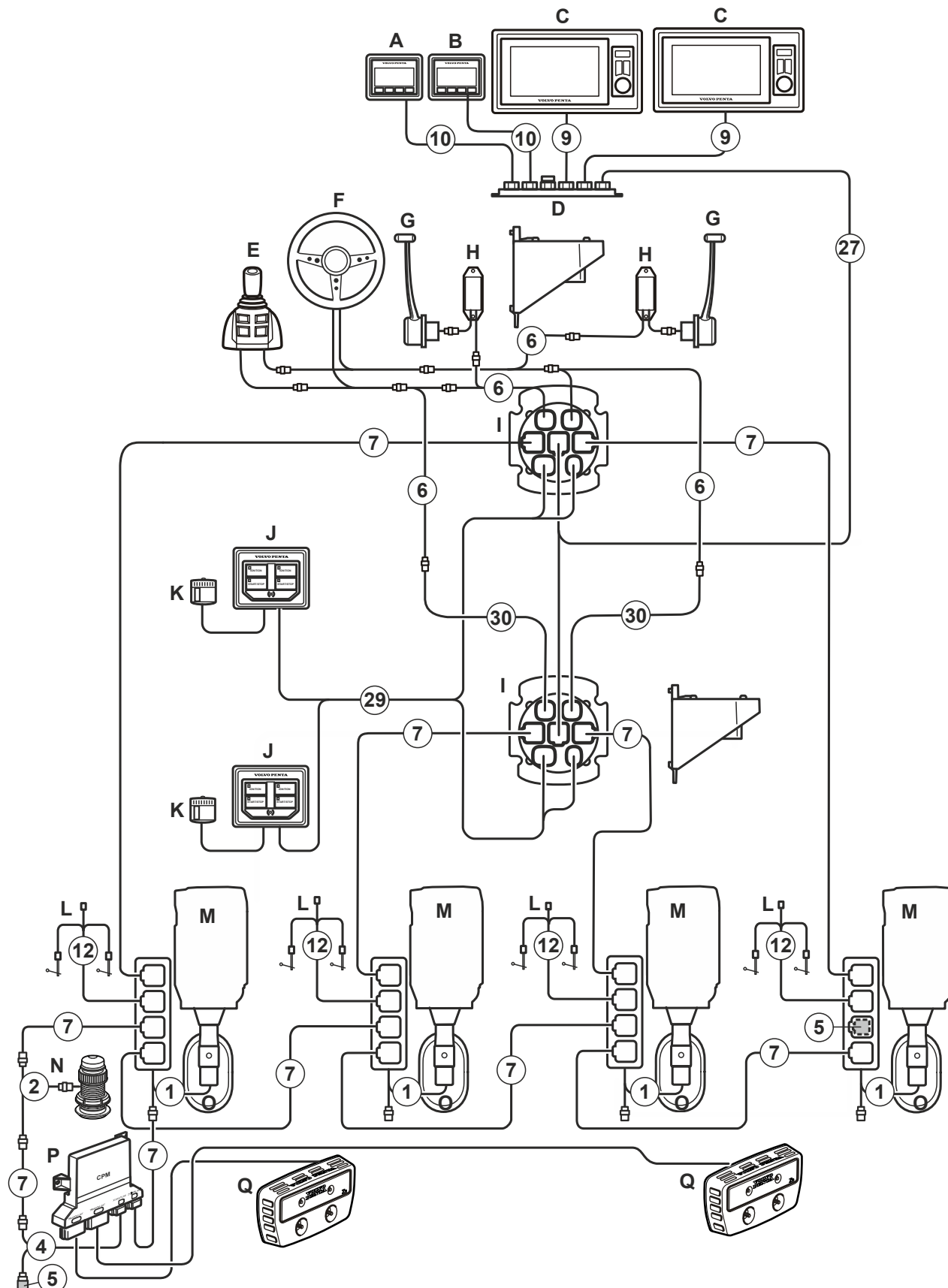
Cables used in station

- 1. Transmission cable, IPS
- 2. Y-split Multisensor
- 4. Y-split CPM
- 5. Termination plug
- 6. Y-split steering, 6-pin
- 7. Standard EVC bus cable, 6-pin
- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 11. Extension cable, 6-pin
- 12. Sensor cable, 6-pin
- 25. e-Key harness with Safety lanyard (option)
- 27. Y-split Hub Triple & Quad, 6-pin
- 28. Y-split datalink, Triple installation, 6-pin
- 30. Adapter cable, 6-pin

Sportfish station

Quad Installation

Example show IPS2 / IPS3



P0019648

Components shown in diagram

- A Multifunction panel (Sport fish panel)
- B Multifunction panel (Station panel)
- C 7" Display
- D Multilink hub
- E Joystick
- F Steering Wheel
- G Lever 'Palm Beach'
- H Analog lever interface (A-CAN)
- I Stand alone HCU/Connections
- J e-Key panel
- K Buzzer
- L Rudder angle sensor (Not in use)
- M Engine
- N Multisensor
- O SUS
- P CPM
- Q ACP

Cables used in station

- 1. Transmission cable, IPS
- 2. Y-split Multisensor
- 4. Y-split CPM
- 5. Termination plug
- 6. Y-split steering, 6-pin
- 7. Standard EVC bus cable, 6-pin
- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 12. Sensor cable, 6-pin
- 27. Y-split Hub Triple & Quad, 6-pin
- 29. e-Key harness Quad
- 30. Adapter cable, 6-pin

Display Options

All installations with EVC-E/E2 must include either a 2.5", 4" or 7" display in one of the combinations shown here.

Max two 7" displays at the same station regardless of installation.

NOTICE! The 2.5" display cannot be used in combination with a 4" or 7" display.

An EVC tachometer can only be used in combination with one of the displays.

Displays and EVC tachometers are connected to the multilink hub. Other gauges are series connected to the tachometer; refer also to *Gauges page 108*.

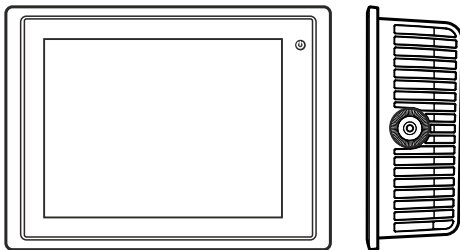
Volvo Penta Glass Cockpit

NOTICE! Applies only to EVC-E2.

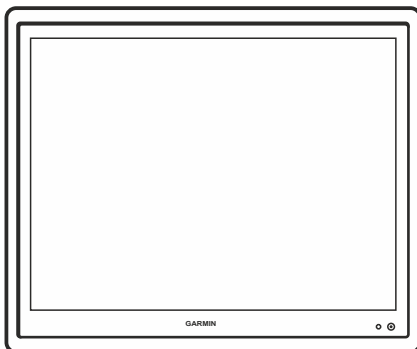
It is not permitted to use Volvo Penta Glass Cockpit displays in combination with 2.5", 4" or 7" displays in the same helm station.

Touchscreen (Multi Function Display, MFD)

There are 8", 12" and 15" displays available with integrated processors and charts.



P0018850

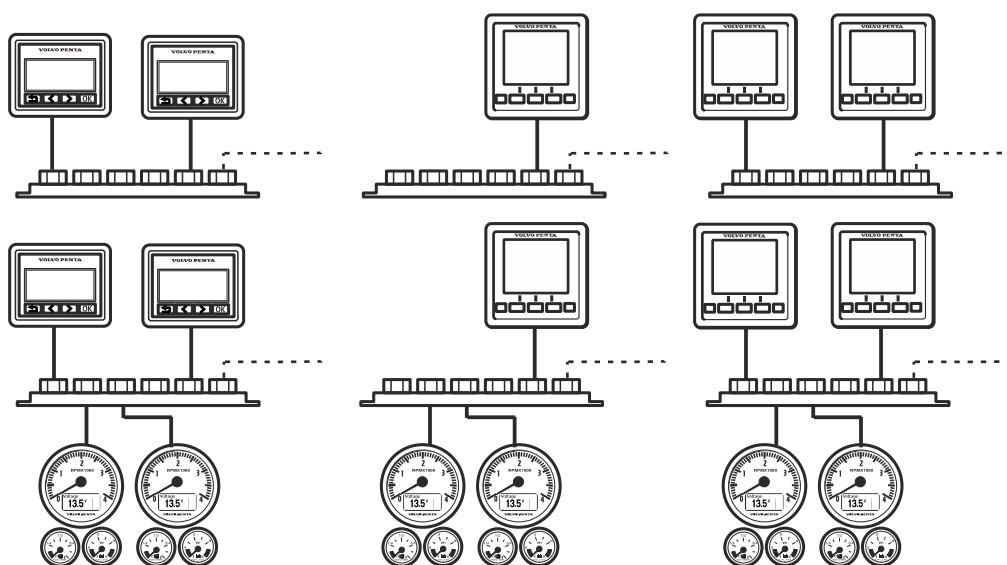


P0018851

Touchscreen (Monitor) with stand-alone processor box

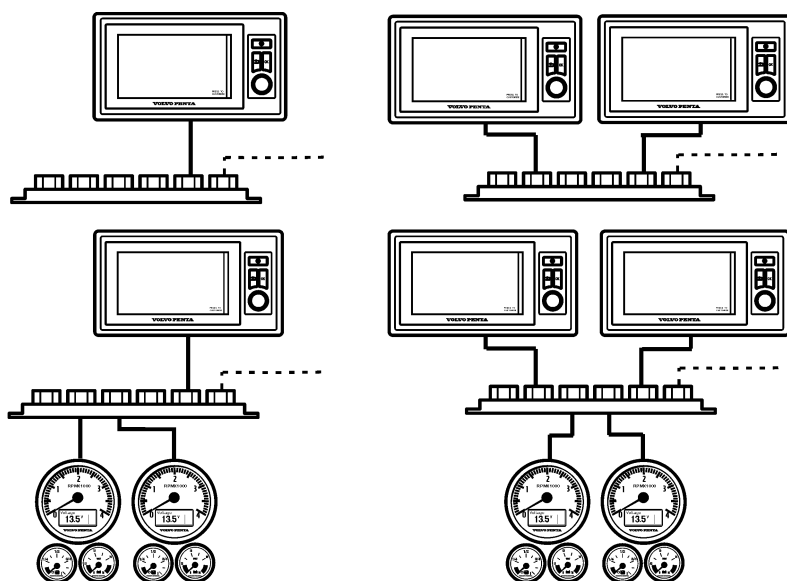
The display is available as 15", 17" and 19".

Twin installation, minimum requirements



P0016743

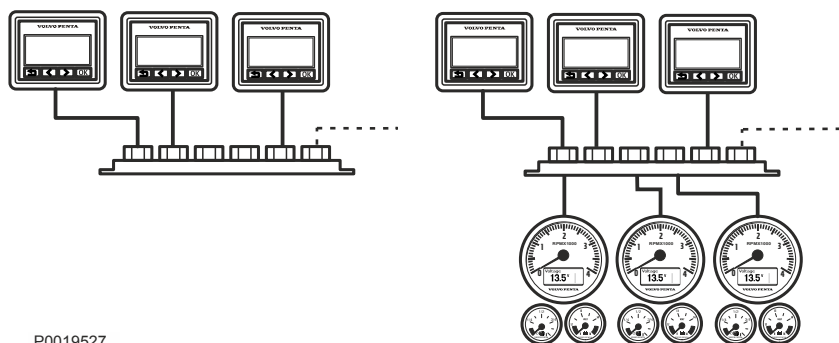
A minimum of two 2.5" displays or one 4" display with or without gauges.
Max two 4" displays per helm station.



P0016744

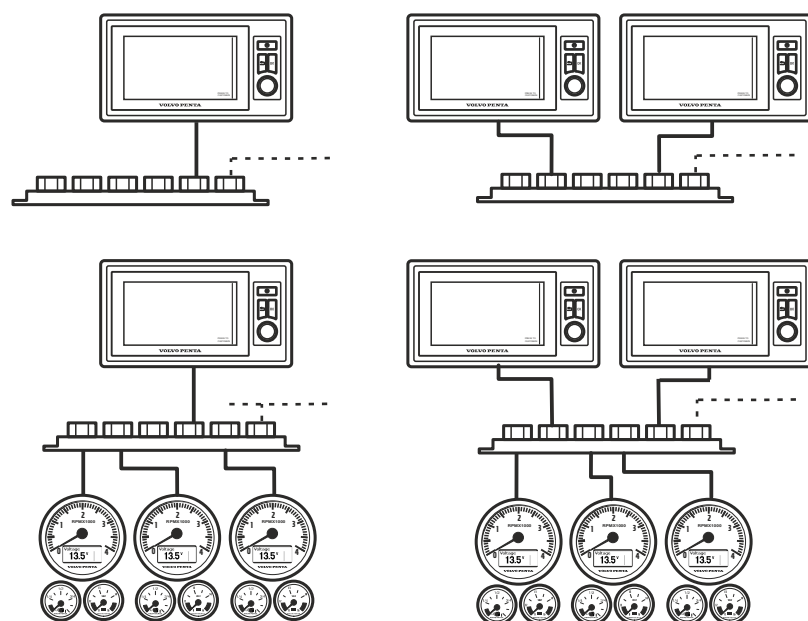
A minimum of one 7" display with or without gauges.
Max two 7" displays, with or without gauges, per helm station.

Triple installation, minimum requirements



P0019527

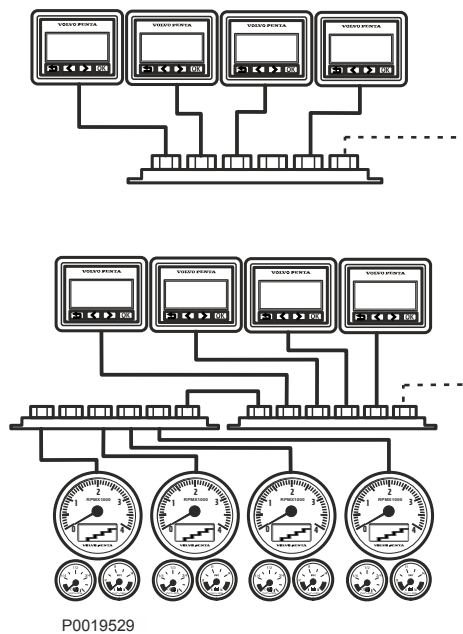
A minimum of three 2.5" display with or without gauges.
Maximum three 2.5" displays per helm station.



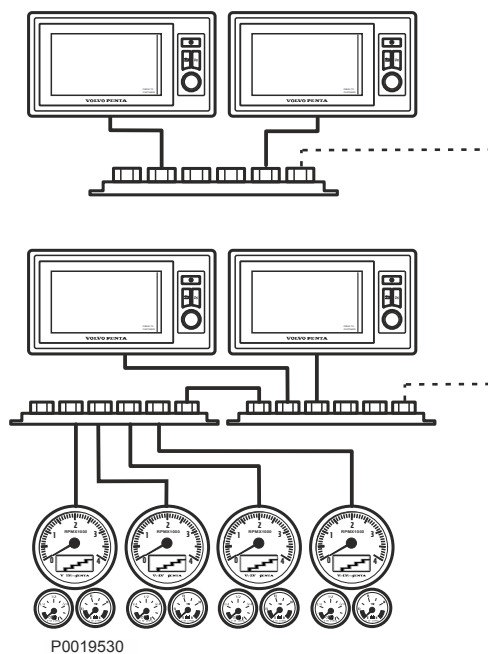
P0019528

A minimum of one 7" display with or without gauges.
Maximum two 7" displays per helm station.

Quad installation, minimum requirements



A minimum of four 2.5" displays with or without gauges.
Maximum four 2.5" displays per helm station.



A minimum of two 7" displays with or without gauges.
Maximum two 7" displays per helm station.

Control System Installation

EVC network requirements

The EVC is a distributed system with electronic units (nodes) located around the boat. The EVC nodes comprise the driveline control unit, PCU (located on the engine) and the HCU (located in the control or the vicinity of the helm station). The nodes are connected to a standard EVC bus cable by means of Y-connectors and extension cables to form a network. There are terminal plugs at each end of the AUX bus.

The network must be designed such that no branches are formed. Branches longer than (max 0.5 m (1.6 ft.)) may disrupt data transfer in the EVC bus cable.

Avoid incorrect connections by always connecting the longer Y-connector cable **directly to the node (PCU or HCU) without any extension cable.**

Consider the following

- 1 Try to keep the cable runs as short as possible, to reduce the risk of voltage drop and interference.
- 2 All cables must be installed at least 300 mm (1 ft.) away from other cables carrying radio frequencies or pulsed signals.
- 3 The underlying material must be sufficiently strong to withstand the weight of the unit and protect it from heavy vibrations or shocks.
- 4 Check that there is sufficient room behind the unit for connectors, so that cables need not be run with sharp bends. Also make sure that there is sufficient cable to allow the unit to be removed for service.

Cable length

Maximum cable length

Multilink: 20 m (65.6 ft.) refers to one way.

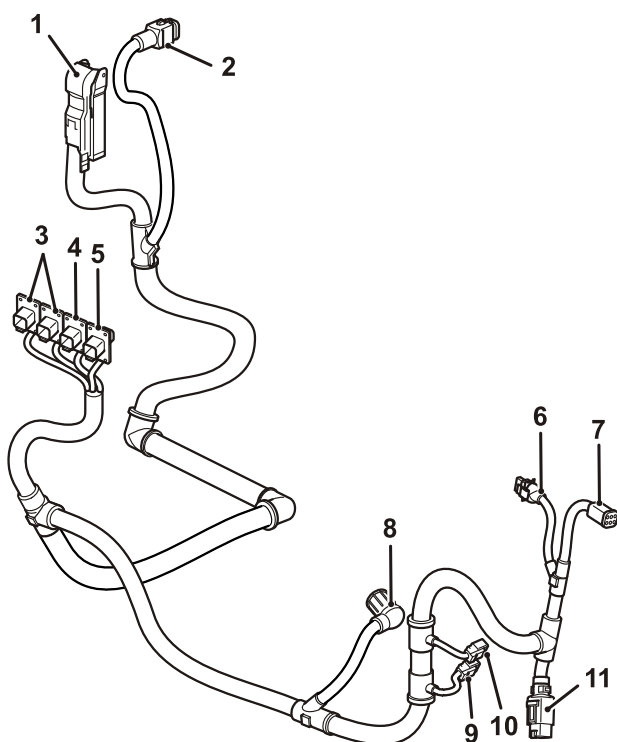
Data link: 40 m (131.2 ft.)

Aux-buss: 40 m (131.2 ft.) Refers to the same length between the nodes (components). There are terminal plugs at the beginnings and ends of the cable nodes.

Cables and cable harnesses

Transmission cable, IPS

IPS350–IPS600



P0016657

Connections to:

- 1 PCU
- 2 ENGINE INTERFACE
- 3 AUX
- 4 DATALINK
- 5 SENDERS
- 6 REV. SENSOR
- 7 SUS
- 8 OIL TEMPERATURE/PRESSURE
- 9 RG VALVE, PRIMARY
- 10 RG VALVE, SECONDARY
- 11 ACM

Part number: 21865860

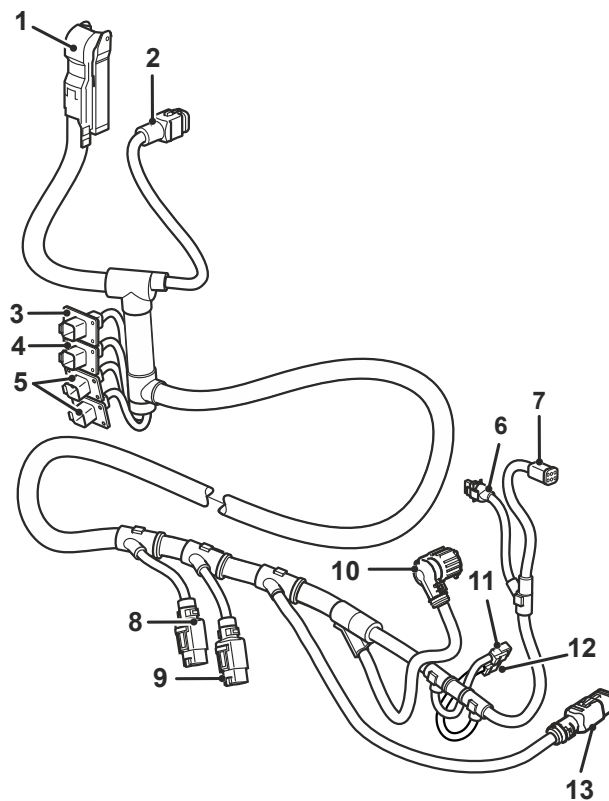
Cable length: 0.6 m (1.9 ft)

Part number: 21865861

Cable length: 1.9 m (6.2 ft)

Transmission cable, IPS

IPS 800-950



P0019886

Connections to:

- 1 PCU
- 2 ENGINE INTERFACE
- 3 DATALINK
- 4 SENDERS
- 5 AUX
- 6 REV. SENSOR
- 7 SUS
- 8 ACM
- 9 CWES connector
- 10 OIL TEMPERATURE/PRESSURE
- 11 RG VALVE, PRIMARY
- 12 RG VALVE, SECONDARY
- 13 OIL QUALITY SENSOR

Part number: 22023225

Cable length: 1.3 m (4.3 ft)

Part number: 22023226

Cable length: 1.7 m (5.6 ft)

Part number: 22023227

Cable length: 2.2 m (7.2 ft)

Part number: 22023228

Cable length: 2.6 m (8.5 ft)

Part number: 22023229

Cable length: 3.1 m (10.2 ft)

Part number: 22023230

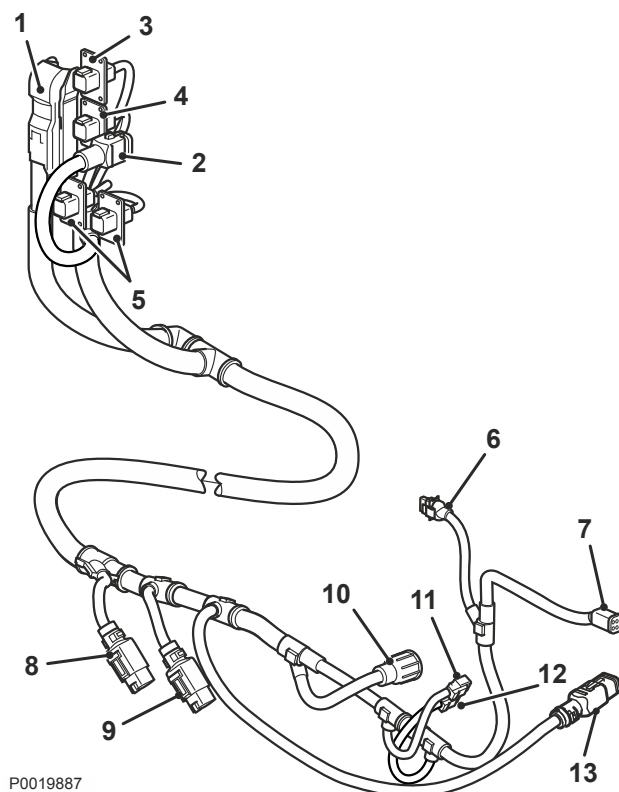
Cable length: 3.5 m (11.5 ft)

Part number: 22023231

Cable length: 5.5 m (18.0 ft)

Transmission cable, IPS

IPS 1050-1200



Connections to:

- 1 PCU
- 2 ENGINE INTERFACE
- 3 DATALINK
- 4 SENDERS
- 5 AUX
- 6 REV. SENSOR
- 7 SUS
- 8 ACM
- 9 CWES connector
- 10 OIL TEMPERATURE/PRESSURE
- 11 RG VALVE, PRIMARY
- 12 RG VALVE, SECONDARY
- 13 OIL QUALITY SENSOR

Part number: 22023238

Cable length: 1.3 m (4.3 ft)

Part number: 22023239

Cable length: 1.7 m (5.6 ft)

Part number: 22023240

Cable length: 2.2 m (7.2 ft)

Part number: 22023241

Cable length: 2.6 m (8.5 ft)

Part number: 22023242

Cable length: 3.1 m (10.2 ft)

Part number: 22023243

Cable length: 3.5 m (11.5 ft)

Part number: 22023244

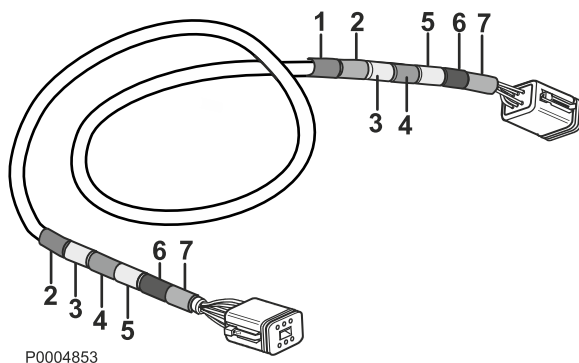
Cable length: 5.5 m (18.0 ft)

Standard EVC bus cable, 6-pin

The standard EVC bus cable connects the engine/PCU to the control/HCU at the helm station(s) in the system. The cable is connected to the engine connector marked DATALINK and to the HCU input marked X2:DATALINK. This cable is also used for the AUX-bus.

NOTICE! One cable per engine must be ordered. The cable has female contacts at both ends and cannot be used as an extension.

Extension cables with male and female connectors at their respective ends are available; refer to *Extension cable, Deutsch, 6-pin* page 76.



- 1 Part number
- 2 Blue
- 3 Green
- 4 Red
- 5 Yellow
- 6 Z1:DATALINK
- 7 X2:DATALINK

IMPORTANT!

The red and green color coding bands indicate port and starboard respectively. Only the appropriate color coding should be allowed to remain in twin installations. The other marking must be removed.

Part number: 21865234

Cable length: 1.5 m (5 ft)

Part number: 874789

Cable length: 5.0 m (16 ft)

Part number: 889550

Cable length: 7.0 m (23 ft)

Part number: 889551

Cable length: 9.0 m (30 ft)

Part number: 889552

Cable length: 11.0 m (36 ft)

Part number: 888013

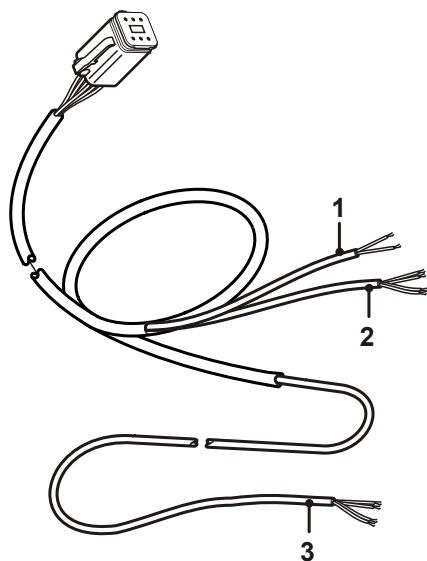
Cable length: 13.0 m (43 ft)

Sender cable, 6-pin

- 1 Fresh water sensor
- 2 Fuel level sensor
- 3 Rudder indicator

Part number: 3807229

Cable length: 5.3 m (17 ft)



P0008474

e-Key harness with Safety lanyard

Connections to:

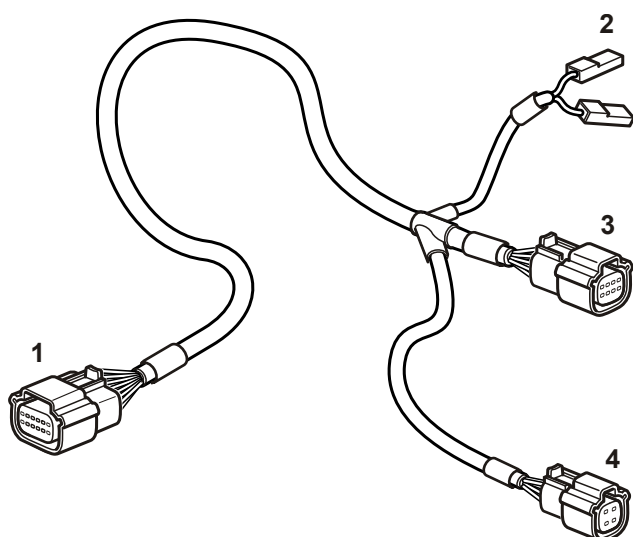
- 1 e-Key panel
- 2 Connection for Safety lanyard
- 3 HCU X4 Port
- 4 HCU X4 Starboard

Part number:

21693202: Single e-Key panel

21693206: Twin e-Key panel

Cable length: 1.5 m (5 ft)



P0016667

e-Key harness without Safety lanyard

Connections to:

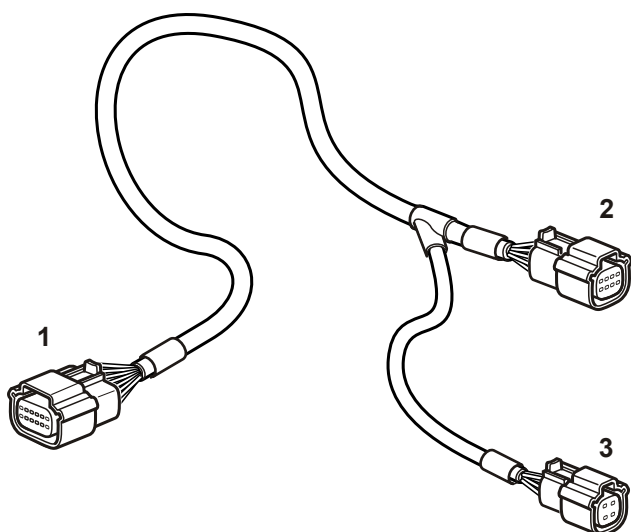
- 1 e-Key panel
- 2 HCU X4 Port
- 3 HCU X4 Starboard

Part number:

21693204: Single e-Key panel

21693208: Twin e-Key panel

Cable length: 1.5 m (5.5 ft)



P0016668

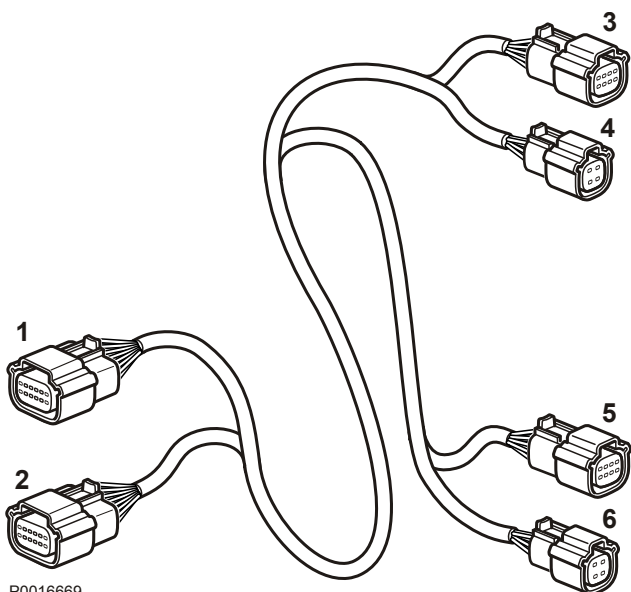
e-Key harness Quad

Connections to:

- 1 e-Key panel port/port center
- 2 e-Key panel starboard/starboard center
- 3 Stand-alone HCU X4/port
- 4 Stand-alone HCU X4/starboard
- 5 Top-mounted HCU X4/port
- 6 Top-mounted HCU X4/Starboard

Part number: 21876876

Cable length: 1.5 m (5 ft)

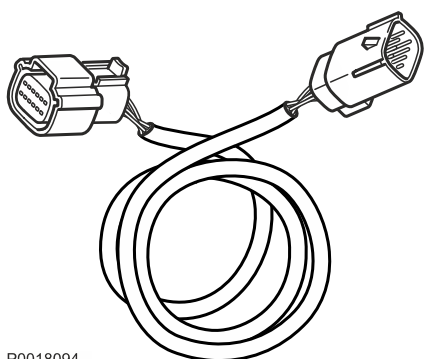


P0016669

e-Key extension cable, 12-pin

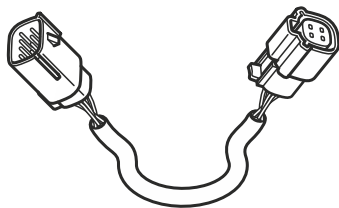
Part number: 22067251

Cable length: 1.5 m (5 ft)



P0018094

Starboard AKI, 4/8-pin

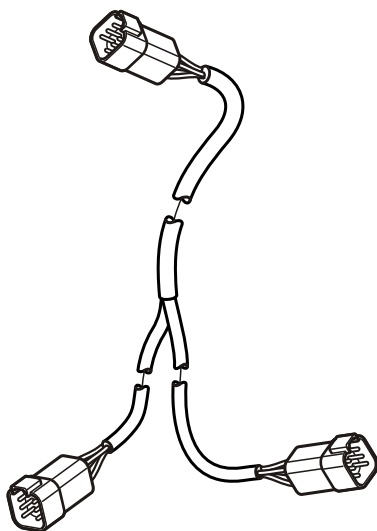


P0017966

Part number: 21421946

Cable length: 0.2 m (0.6 ft)

Y-split Multisensor

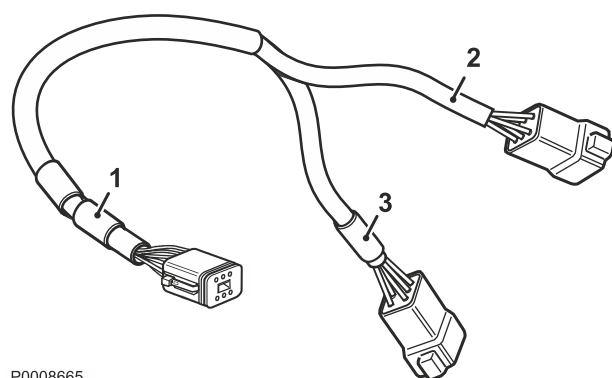


P0016300

Part number: 21825662

Cable length: 0.6 m (1.9 ft)

Y-split multilink, 6-pin



P0008665

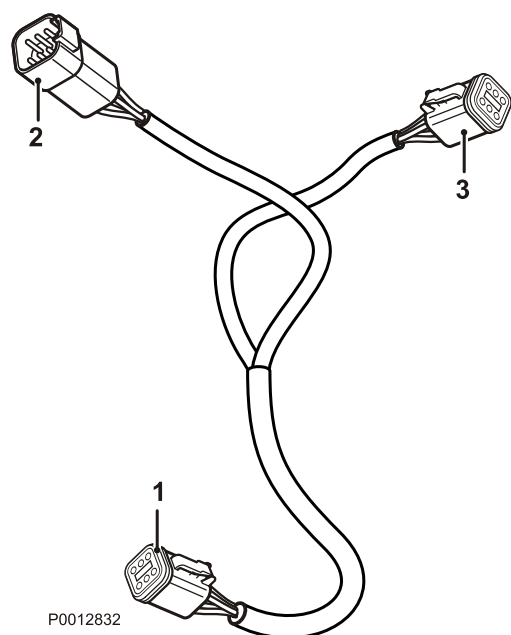
1 MULTILINK, yellow marking, part number

2 MULTILINK, BREAKOUT, yellow cable

3 MULTILINK, yellow marking

Part number: 3588206

Cable length: 0.5 m (1.6 ft)



Y-connector, 6-pin

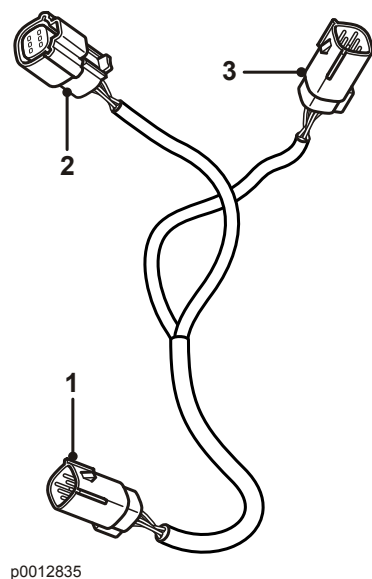
- 1 Connects to control/HCU.

NOTICE! Must be connected directly without extension cable.

- 2 Connects to engine/PCU via standard bus cable.
- 3 Connects to secondary helm station via extension cable.

Part number: 3588972

Cable length: 0.5 m (1.6 ft)



Y-split steering

Connections:

- 1 Connect to steering.
- 2 Connect to HCU via adapter cable.
- 3 Connect to possible joystick.

Part number: 21421941

Cable length: 0.4m (1.3 ft)

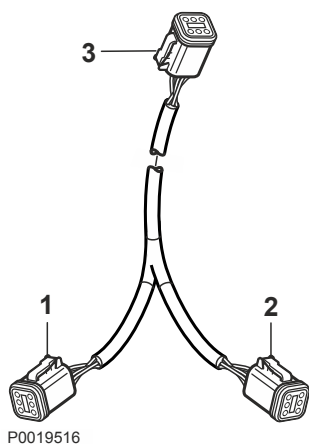
Y-split Hub Triple & Quad

Connections to:

- 1 X5:MULTILINK on HCU.
- 2 X5:MULTILINK on HCU.
- 3 Multilink hub via extension cable, if present.

Part number: 21287072

Cable length: 1.0 m (3 ft)



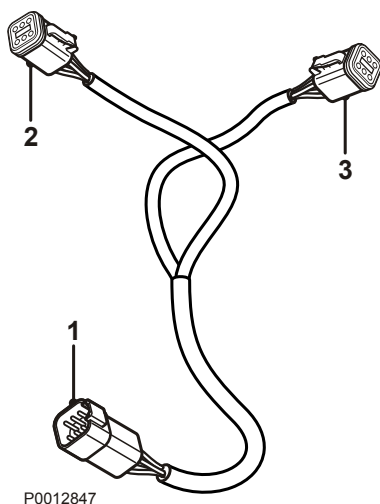
Y-split datalink Triple installation

Connections:

- 1 Connect the midships engine connector marked DATALINK via a standard EVC bus cable.
- 2 Connect to X2:DATALINK on stand-alone HCU. Red marking to port.
- 3 Connect to X2:DATALINK on stand-alone HCU. Green marking to starboard.

Part #: 21427460

Cable length: 0.4 m (1.3 ft)

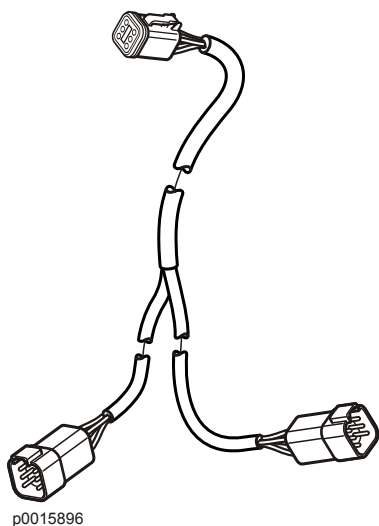


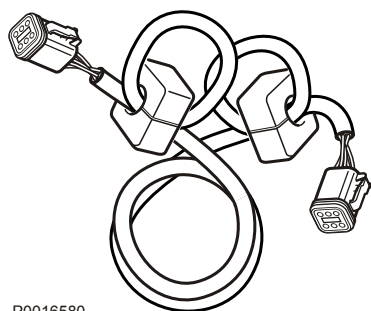
Y-split CPM

Part number: 2185665*

Cable length: 0.6 m (1.9 ft)

* Connects to the AUX bus.





P0016580

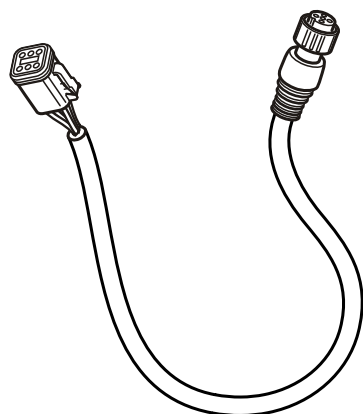
7" Display cable, 6-pin

Connect the cable ends to the 7" display and the multilink hub.

Part number: 21514712*

Cable length: 1.7 m (5.5 ft)

* included in display kit



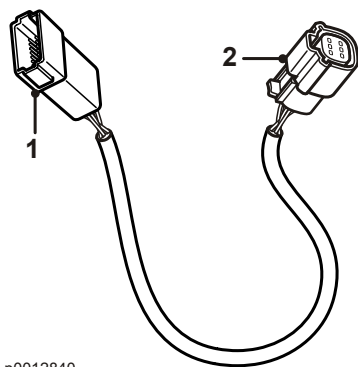
P0014882

4" Display cable, 5/6 pin

Part number: 21640400*

Cable length: 1.5 m (5 ft)

* Included in the display kit



p0012840

Adapter Steering, 12/6-pin

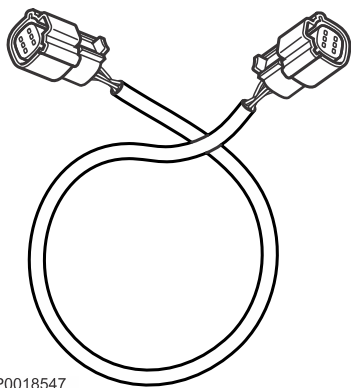
Adapter cable Deutsch 12-pole to Molex 6 pole

Connections:

- 1 Connect to steering or 4-20 mA interface
- 2 Connect to HCU

Part number: 21421945

Cable length: 0.2 m (0.6 ft)

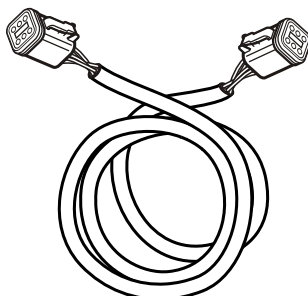


P0018547

Adapter cable, 6-pin

Part number: 21450563

Cable length: 0.5 m (1.6 ft)



s25728

Multilink cable, 6-pin

Female/female connection. Used for connecting a 2.5" display, a multifunction panel, EVC tachometer, CCU, Autopilot display and a multilink hub to the HCU/ control.

Part number: 3886666

Cable length: 1.5 m (5 ft)

Part number: 21166002

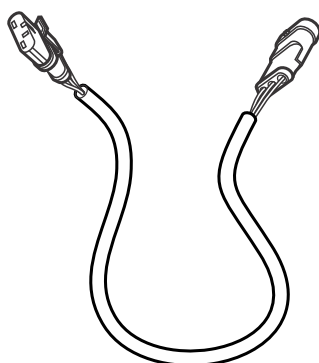
Cable length: 7.0 m (23 ft)

Part number: 21166003

Cable length: 9.0 m (30 ft)

Part number: 21166004

Cable length: 13.0 m (43 ft)



P0016291

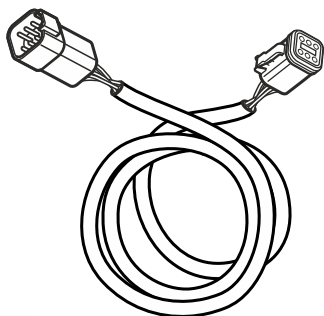
Extension cable, 3-pin

Part number: 874759

Cable length: 1.0 m (3 ft)

Part number: 3807043

Cable length: 3.0 m (10 ft)



P0012837

Extension cable, Deutsch, 6-pin

Part number: 3889410

Cable length: 1.5 m (5 ft)

Part number: 3842733

Cable length: 3.0 m (10 ft)

Part number: 3842734

Cable length: 5.0 m (16 ft)

Part number: 3842735

Cable length: 7.0 m (23 ft)

Part number: 3842736

Cable length: 9.0 m (30 ft)

Part number: 3842737

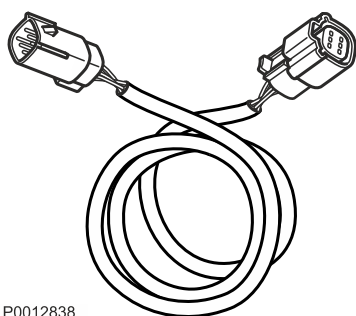
Cable length: 11.0 m (36 ft)

Part number: 21172469

Cable length: 20.0 m (66 ft)

Part number: 21172470

Cable length: 40.0 m (131 ft)



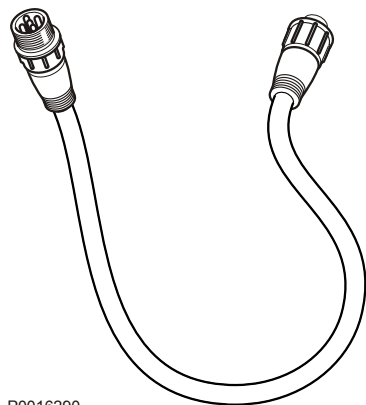
P0012838

Extension cable Molex, 6-pin

Part number: 21480272

Cable length: 1.5 m (5 ft)

NMEA2000 Extension cable



P0016290

Part number: 21812185

Cable length: 0.3 m (1 ft)

Part number: 21812194

Cable length: 2 m (6.6 ft)

Part number: 21867150

Cable length: 4 m (13 ft)

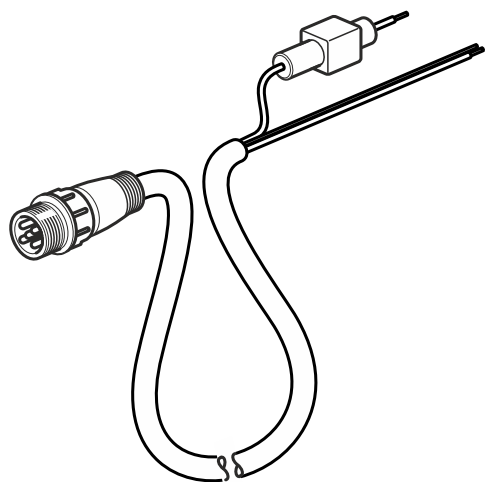
Part number: 21867151

Cable length: 6 m (19 ft)

Part number: 21867152

Cable length: 10 m (33 ft)

NMEA2000 Powercable



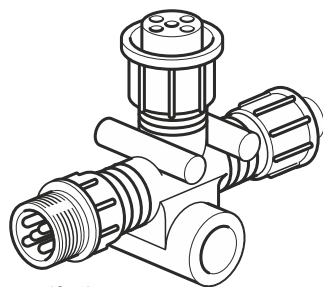
P0016304

Part number: 21812205*

Cable length: 3 m (9.9 ft)

* Included in the Autopilot kit.

NMEA2000 T-connector



P0018304

Part number: 21812195*

Cable length: 0.3 m (1 ft)

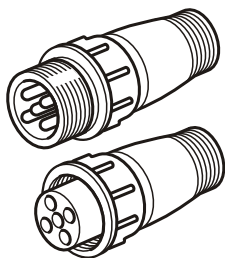
* Included in the Autopilot kit.

NMEA2000 Termination plugs

Part number, male connector 21812196*

Part number, female connector 21812203*

* Included in the Autopilot kit.



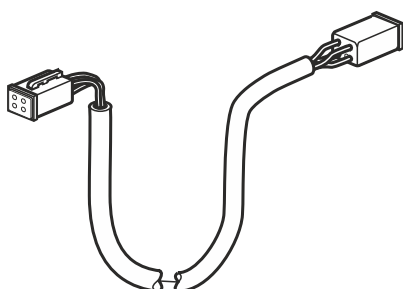
P0016306

Interceptor servo cable

Part number: 21875632*

Cable length: 0.4 m (13 ft)

* Included in the Interceptor kit.



P0017632

Aux. Relay Cable, 6-pin

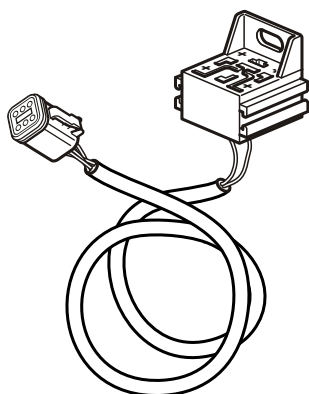
Part number: 21427463

Cable length: 1 m (3.3 ft)

Kit with cable and relay

12V: **21475508**

24V: **21475509**



s25727

Extension cable, 6-pin

Part number: 21166002

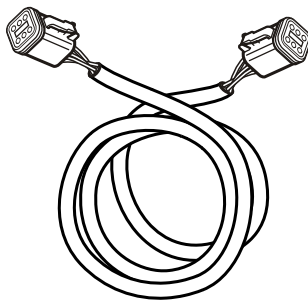
Cable length: 7 m (23 ft)

Part number: 21166003

Cable length: 9 m (30 ft)

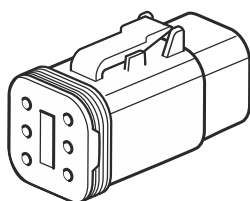
Part number: 21166004

Cable length: 11 m (43 ft)



s25728

Connect one end to the component and the other end to X5:STEERING on the HCU.



P0015942

Termination plug

For the AUX-bus

Part number: 21825714

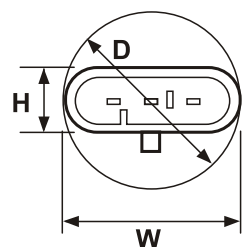
Connector dimensions

3-pin

H: 18 mm (0.71")

W: 26 mm (1.02")

D: 26 mm (1.02")



P0007272

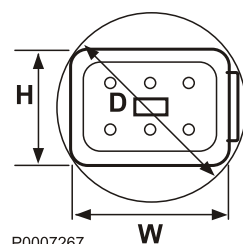
3-pin

6-pin

H: 21 mm (0.82")

W: 23 mm (0.88")

D: 32 mm (1.26")



P0007267

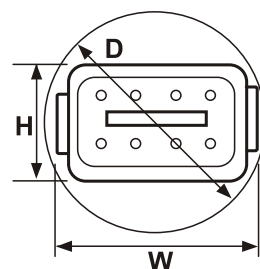
6-pin

8-pin

H: 25 mm (0.99")

W: 37 mm (1.44")

D: 45 mm (1.77")



P0007268

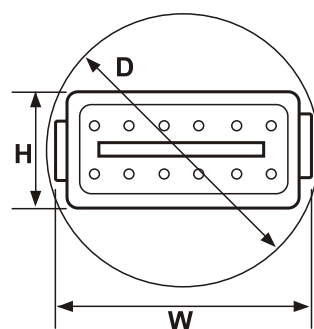
8-pin

12-pin

H: 23 mm (0.88")

W: 41 mm (1.62")

D: 48 mm (1.90")



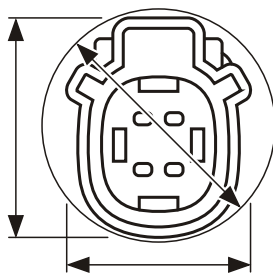
P0007269

12-pin

Molex Connector

4-pin

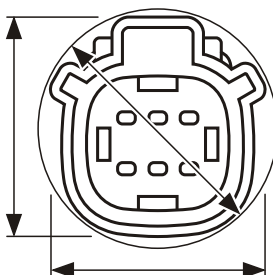
H: 25 mm (0.97")
W: 18.5 mm (0.73")
D: 25.5 mm (1.00")



s25698

6-pin

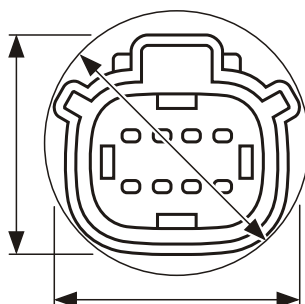
H: 25 mm (0.97")
W: 22 mm (0.87")
D: 26.5 mm (1.03")



s25699

8-pin

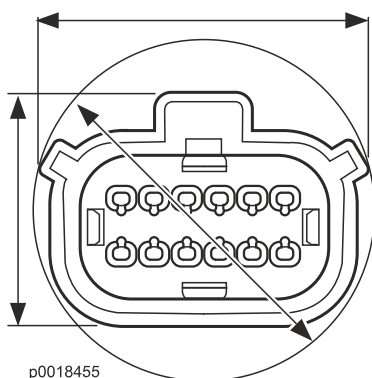
H: 25 mm (0.97")
W: 29.5 mm (1.15")
D: 25.5 mm (1.0")



s25700

12-pin

H: 25 mm (0.97")
W: 32.6 mm (1.28")
D: 41 mm (1.61")



p0018455

Connector

All connectors shown from wiring side

1 Female contact (sleeve)

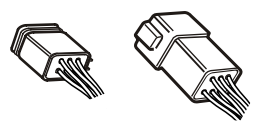
2 Male contact (pin)

R (red)

+ (positive)

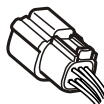
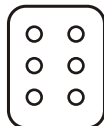
SB (black)

– (negative)



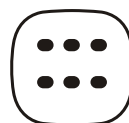
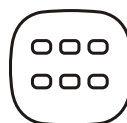
1

2



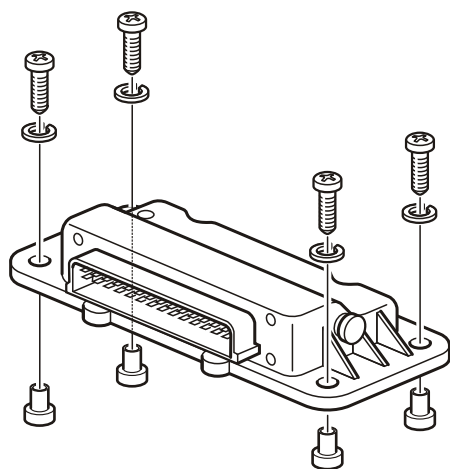
1

2



P0016745

Engine Room



P0016674

PCU

The PCU is connected to the engine and drive. It is also connected to the HCU via a standard bus cable.

NOTICE! PCUs are engine mounted on D4, D6, D11 and D13 engines.

Installation

- PCU nodes must **always** be attached with four bolts, with spacers.
- PCUs must be installed and their cables run in such a way that water cannot penetrate the units or their harnesses.

IMPORTANT!

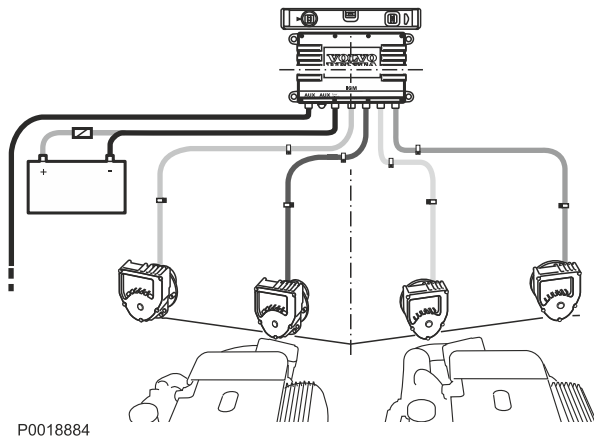
Never install PCU units with connector blocks pointing upwards.

IMPORTANT!

Because it is extremely important to reduce cable load on the connectors, we recommend the use of cable ties for strain relief.

IMPORTANT!

Always check that the locking mechanism between male and female connectors locks. This guarantees a correct water-tight seal.



Volvo Penta Interceptor System

NOTICE! Applies to EVC-E2 installations.

The Volvo Penta interceptor system is a trim system that uses interceptors installed on the transom to act on a boat's running characteristics and provide a safer, more comfortable passage regardless of weather conditions.

The IS system affects a boat's running characteristics at speeds of ≈ 10 knots and above.

Refer to the installation posters supplied and the installation instructions included in the packaging. For publication numbers, refer to the chapter: *Publications page 10*.

The IS system must be calibrated so that it is activated and functions as intended; refer to the chapter: *Calibration of Interceptor System page 169*.

Use the AUX connectors on the ICM unit for connection to the EVC-E2 system via the AUX bus.

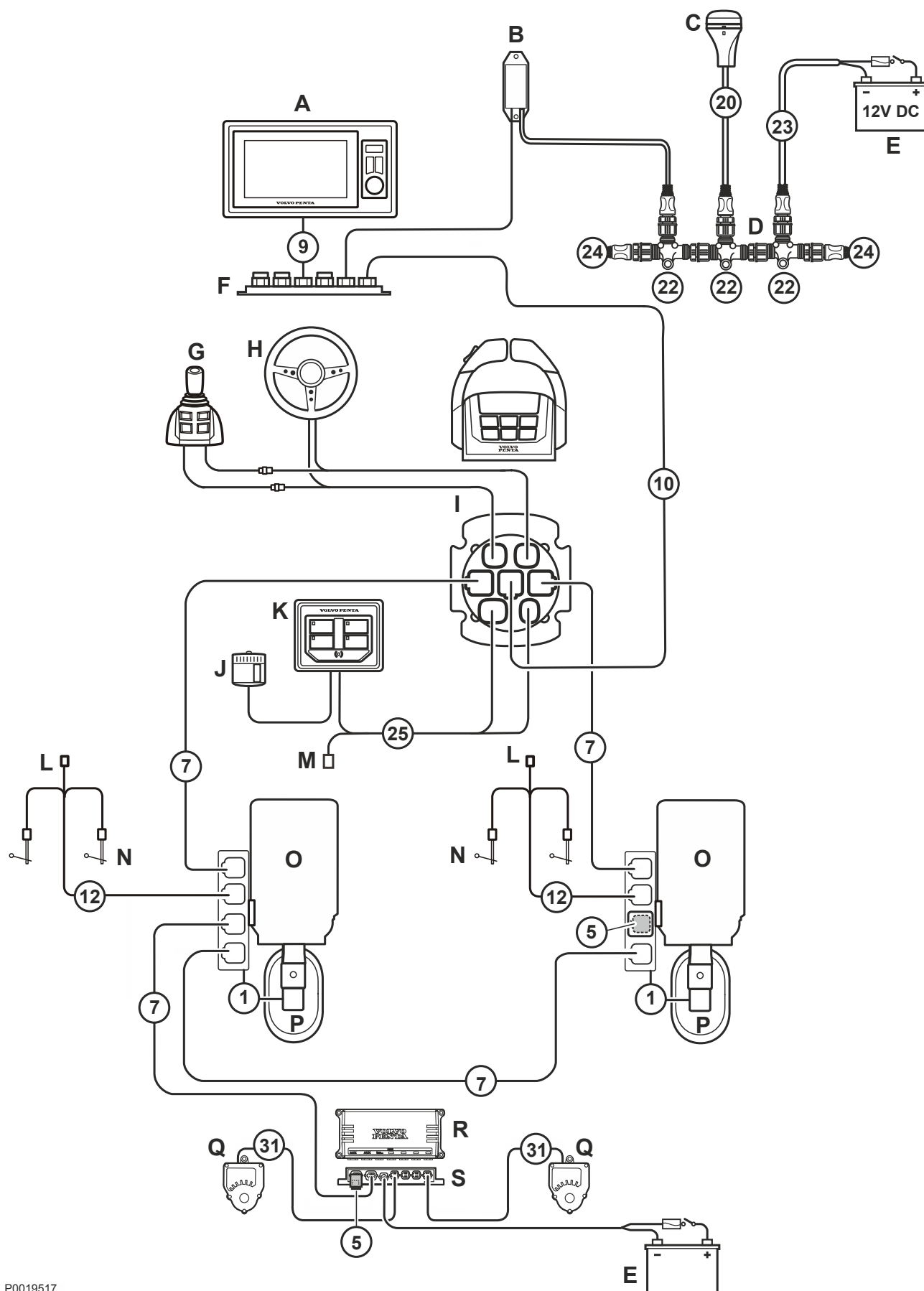
Refer to: *Aux bus page 88*.



A series of horizontal dotted lines spanning the width of the page, providing a guide for handwriting practice. There are 20 rows of these dotted lines.

Volvo Penta Interceptor System

Example installation



P0019517

Components shown in diagram

- A 7" Display
- B NMEA2000 interface
- C GPS19x-NMEA2000
- D NMEA2000 backbone
- E Battery (orange indication)
- F Multilink hub
- G Joystick
- H Steering Wheel
- I Control/HCU connections
- J Buzzer
- K e-Key panel
- L Sensor, fuel- and fresh water level
- M Connection for Safety lanyard
- N Rudder angle sensor (Not in use)
- O Engine
- P SUS
- Q Interceptor servo module
- R ICM, Interceptor Control Module
- S Interceptor connection panel, color coded

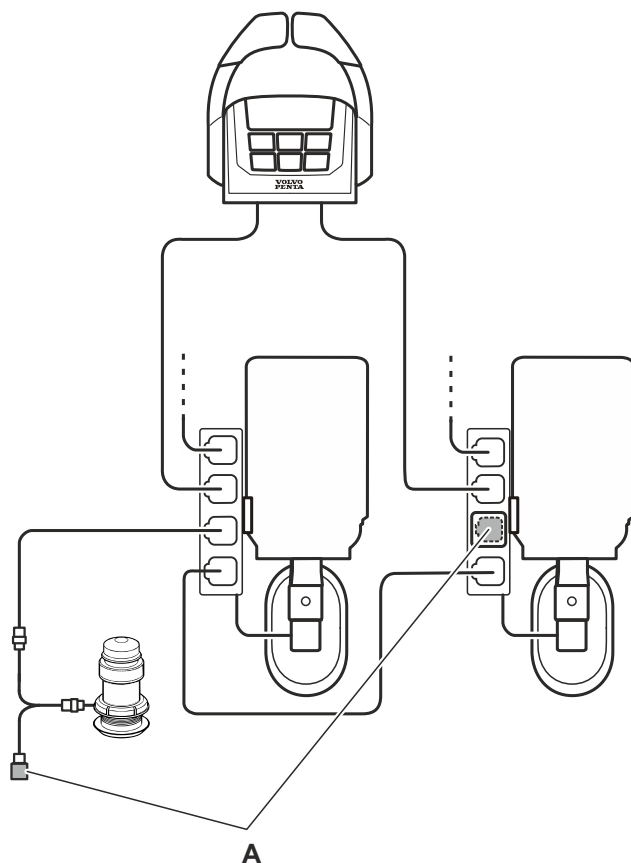
Cables used in station

- 1. Transmission cable, IPS
- 5. Termination plug
- 7. Standard EVC bus cable, 6-pin
- 9. 7" Display cable, 6-pin
- 10. Multilink cable, 6-pin
- 12. Sensor cable, 6-pin
- 20. NMEA2000 Extension cable
- 22. NMEA2000 T-connector
- 23. NMEA2000 Powercable
- 24. NMEA2000 Termination plugs
- 25. e-Key harness with Safety lanyard (option)
- 31. Interceptor servo cable

Aux bus

Multisensors and the Interceptor System are connected to the AUX bus. Do not connect them to the Multilink. A new adapter harness is used for the Multisensor. This harness changes the pinout.

Max AUX bus length is 40 m (131 ft). Termination plugs are used if anything is connected to the AUX bus. Use a termination plug at the beginning of the chain and one at the end as denoted by **A** in the illustration.

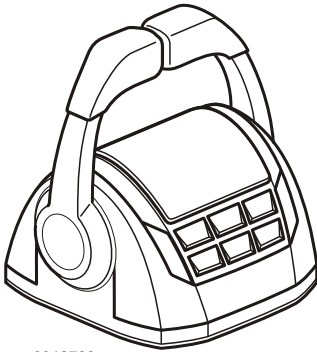


P0019481

Controls

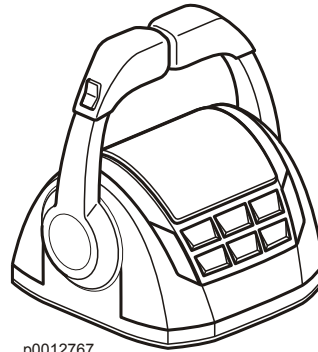
Top mounted levers

Controls for electronic engine speed and gear shift management, with integrated HCU and function buttons.



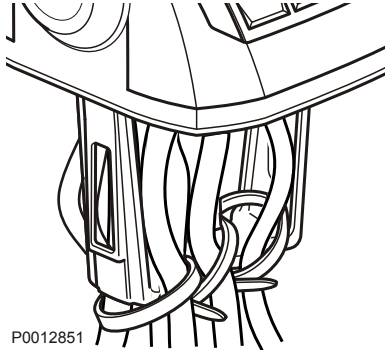
p0012768

Twin control levers



p0012767

Twin control levers with trim buttons



P0012851

Installation

Follow the installation instructions and use the templates provided with the control levers. Adjust the friction and pawl mechanism according to the installation instructions.

IMPORTANT!

The red marking is for the port engine and the green marking for the starboard engine.

IMPORTANT!

Make sure that the locking mechanism between the connectors closes with a click. This guarantees a proper watertight connection.

NOTICE! Make sure there is sufficient cable slack.

Connections to lever and HCU

X2: DATALINK

Color: Green

Connection: Data link – Standard EVC bus cable

X4: KEY

Color: Gray

Connection: e-Key panel, AKI (Analog Key Interface)

X5: MULTILINK

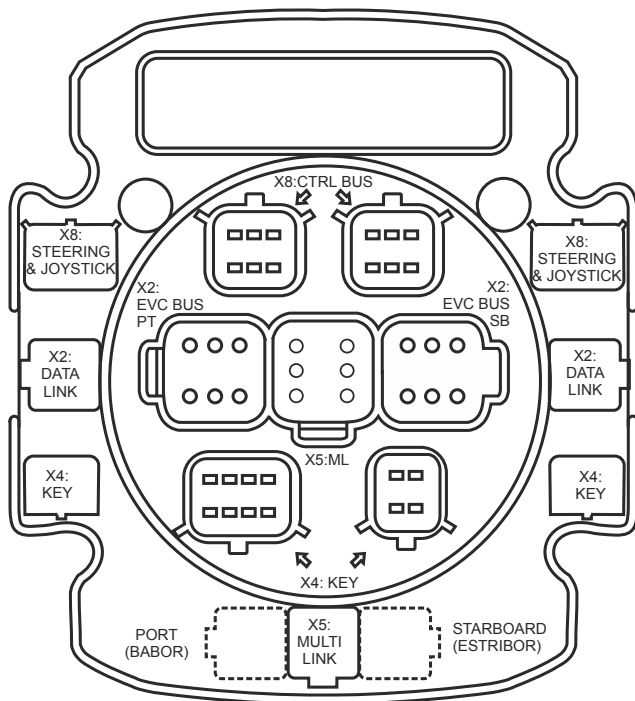
Color: Yellow

Connection: Multilink – Multilink hub, 2.5" display, 4" display, 7" display, Multifunction panel, EVC tachometer/gauge, NMEA interface, Autopilot, CCU and Relay cable.

X8: STEERING & JOYSTICK

Color: Brown

Connection: Steering, Joystick, A-CAN, interface 4-20mA



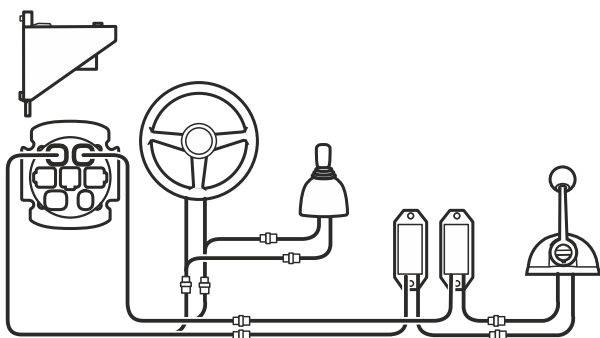
P0012799

HCU connections

Connection analog levers

A-CAN adapter(s) and a stand-alone HCU are required when using analog controls together with the EVC-E/E2 system.

- 1 Connect each output from the controls to an A-CAN adapter.
- 2 Then connect the A-CAN adapters to a stand-alone HCU.



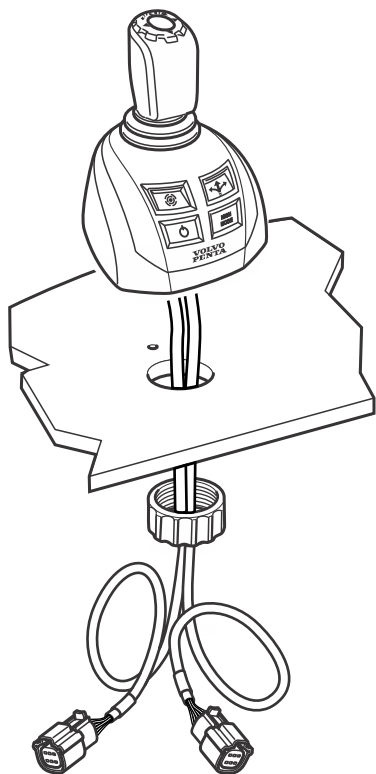
P0013834

Twin installations with analog controls and electronic steering.

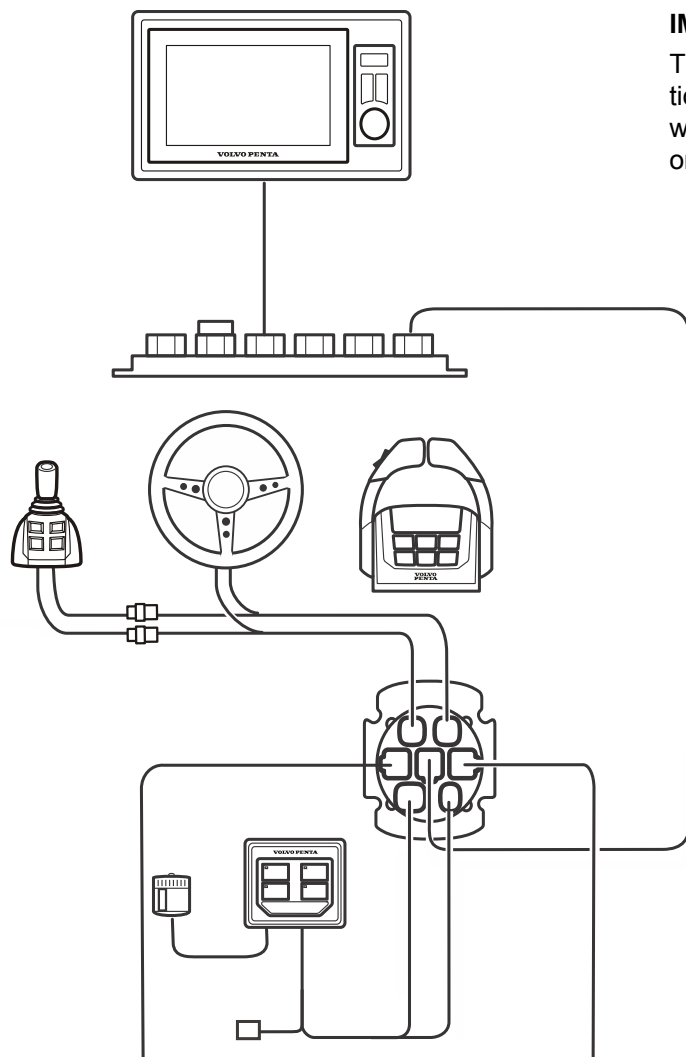
Joystick

The joystick allows a boat to be maneuvered with great precision at low speeds. The joystick is connected to the steering CAN bus.

Follow the installation instructions and use the templates provided with the control.



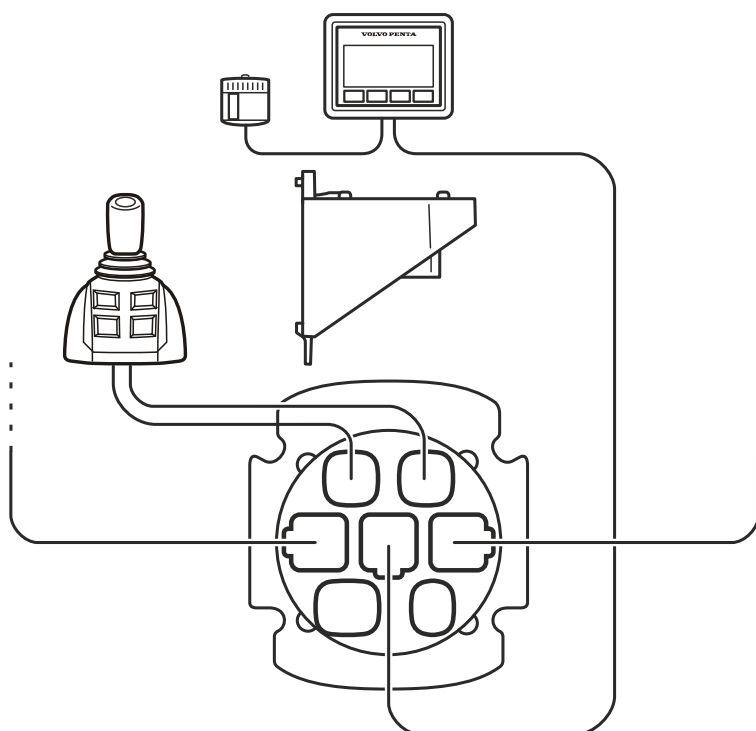
P0013205



P0018840
Secondary helm station

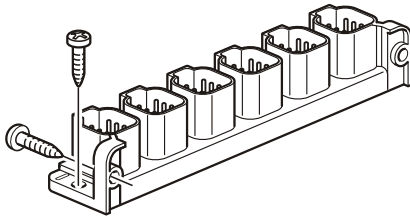
IMPORTANT!

The Volvo Penta Joystick can be installed in combination with the Volvo Penta control unit for steering wheels and control levers or a docking station. Only one joystick per control station can be installed.



P0012069
Docking station

Helm station



p0013427

Multilink hub

The Multilink is the EVC system hub. Things such as the 2.5" display, 7" display, multi-function panel etc. are connected to it.

Installing the Multilink hub.

The Multilink hub may be installed on a vertical or horizontal surface.

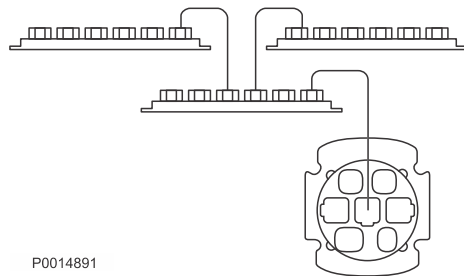
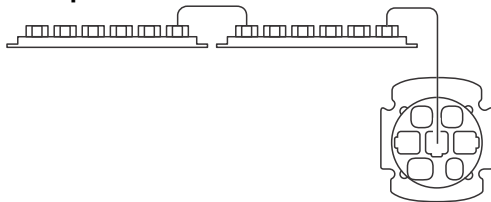
It is attached with two screws or cable ties to a suitable surface.

Connecting multiple Multilink hubs

Max length, Multilink: 20 m (66 ft.) refers to one way. Several hubs may be connected together, but the following must be observed.

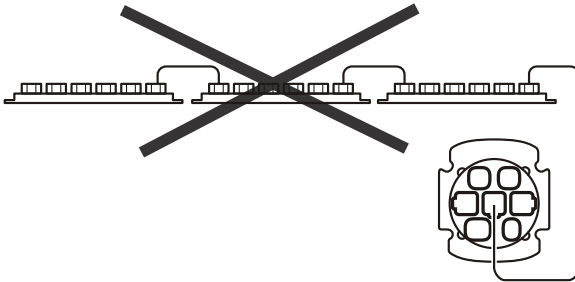
Connection as illustrated to the left is acceptable.

Acceptable.



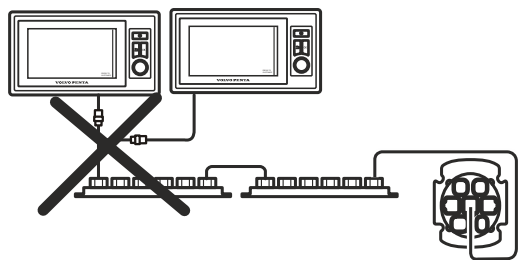
P0014891

UNACCEPTABLE.



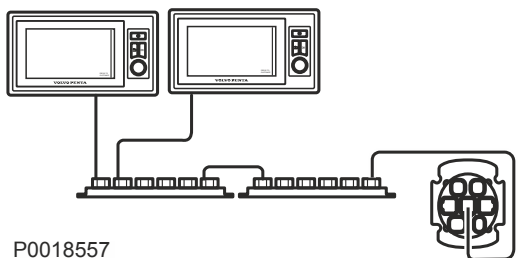
P0017430

The adjacent connection is unacceptable. Series connection of three or more multilink hubs is not permitted.



Connection of a unit (display or tachometer) more than 3 m (10 feet) from the multilink hub must take place via a Y-split before the first hub.

The use of Y-splits or extension cables in the multilink hub is not permitted. The maximum distance from the hub to the unit is 3 m (10 feet).

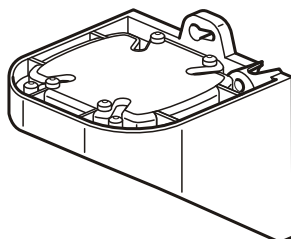


P0018557

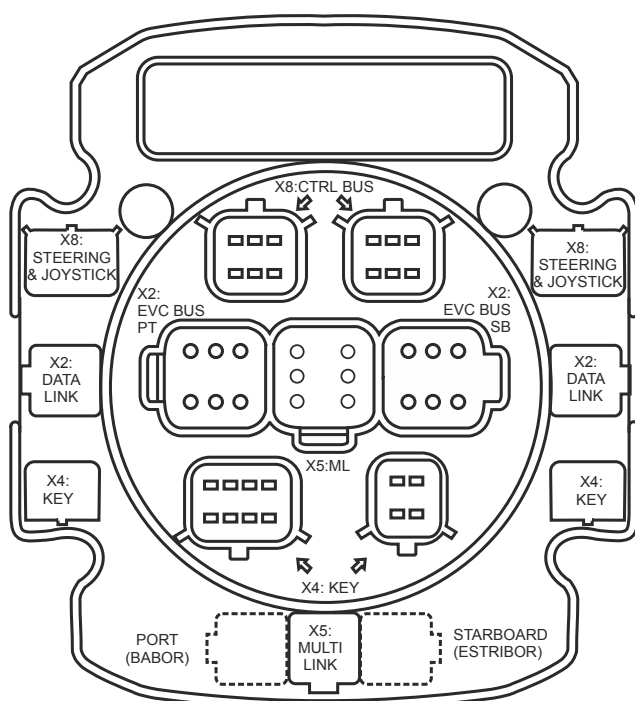
Stand alone HCU

A stand-alone HCU is used for docking stations, for connecting analog control levers and triple and quad installations.

Follow the installation instructions supplied with the materials kit.



s25683



P0012799

HCU connections

X2: DATALINK

Color: Green

Connection: Data link – Standard EVC bus cable

X4: KEY

Color: Gray

Connection: e-Key panel, AKI (Analog Key Interface)

X5: MULTILINK

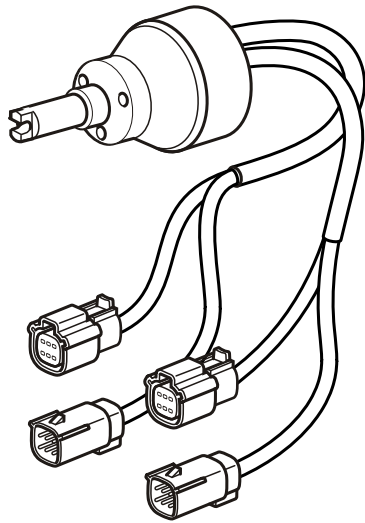
Color: Yellow

Connection: Multilink – Multilink hub, 2.5" display, 4" display, 7" display, Multifunction panel, EVC tachometer/gauge, NMEA interface, Autopilot, CCU and Relay cable.

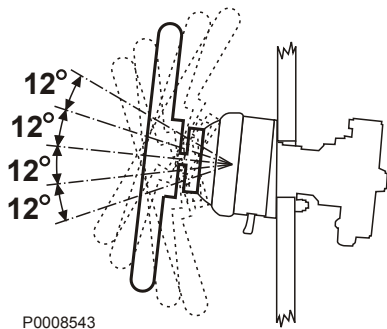
X8: STEERING & JOYSTICK

Color: Brown

Connection: Steering, Joystick, A-CAN, interface 4-20mA.



s25733



P0008543

Control unit

- Try to keep the cable runs as short as possible, to reduce the risk of voltage drop and interference.
- All cables must be installed at least 300 mm away from other cables carrying radio frequencies or pulsed signals.
- The underlying material must be sufficiently strong to withstand the weight of the unit and protect it from heavy vibrations or shocks.
- Check that there is sufficient room behind the unit for connectors, so that cables need not be run with sharp bends. Also make sure that there is sufficient cable to allow the unit to be removed for service.

IMPORTANT!

A magnetic compass may not be installed closer to the steering unit than 80 cm (2.6 ft).

The helm station steering unit has a number of position sensors and two cables, length 2.5 m (8.2 ft). The cables are connected to the HCU.

IMPORTANT!

Steering wheel adjustment is mandatory. The steering wheel adjuster is located in the helm station steering unit; it allows the wheel to be adjusted through $\pm 24^\circ$ in 12° steps.

Always install the steering wheel adjuster in the helm steering unit. The tapered part of the spindle fits both UNI EN 288848 and ABYC P21.

IMPORTANT!

The steering wheel may have a diameter of up to 400 mm (15.8") and its hub a height of max 130 mm (5.1").

Installing the steering wheel adjuster

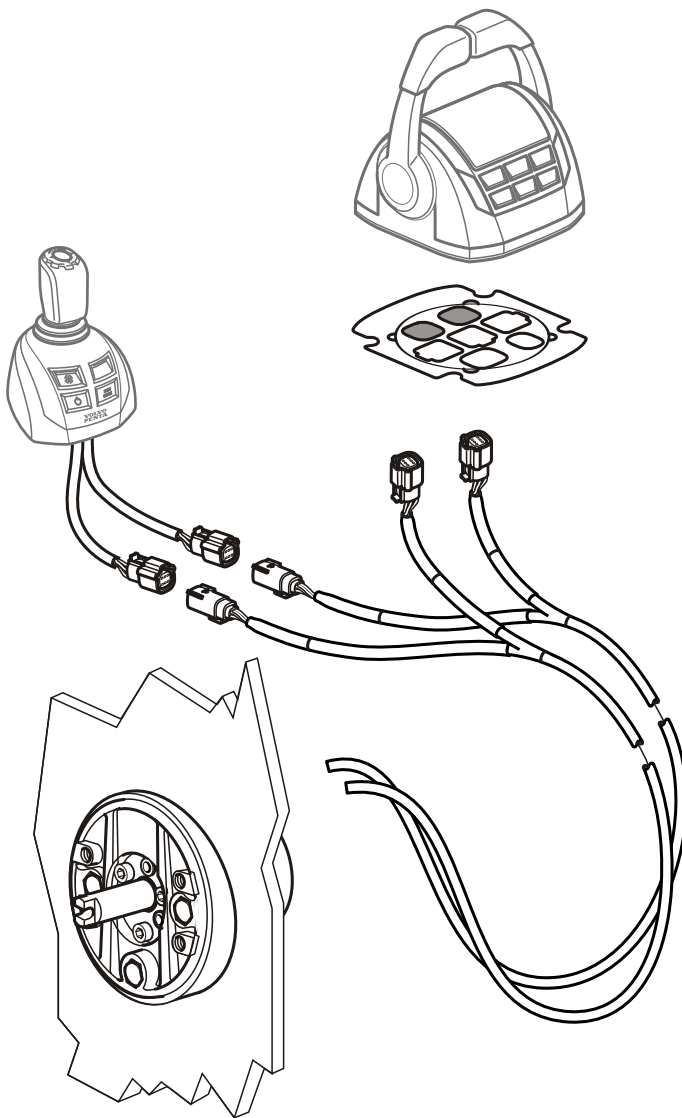
Follow the installation instructions and use the templates provided with the steering wheel bracket.

Connecting the steering unit

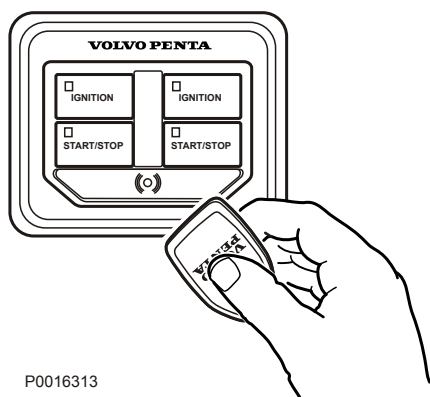
- 1 Connect the signal cables (STEERING) from the steering unit to the control levers.
Connect the joystick to the signal cables (STEERING JOYSTICK).

IMPORTANT!

Make sure that the locking mechanism between the connectors closes with a click. This guarantees a proper watertight connection.

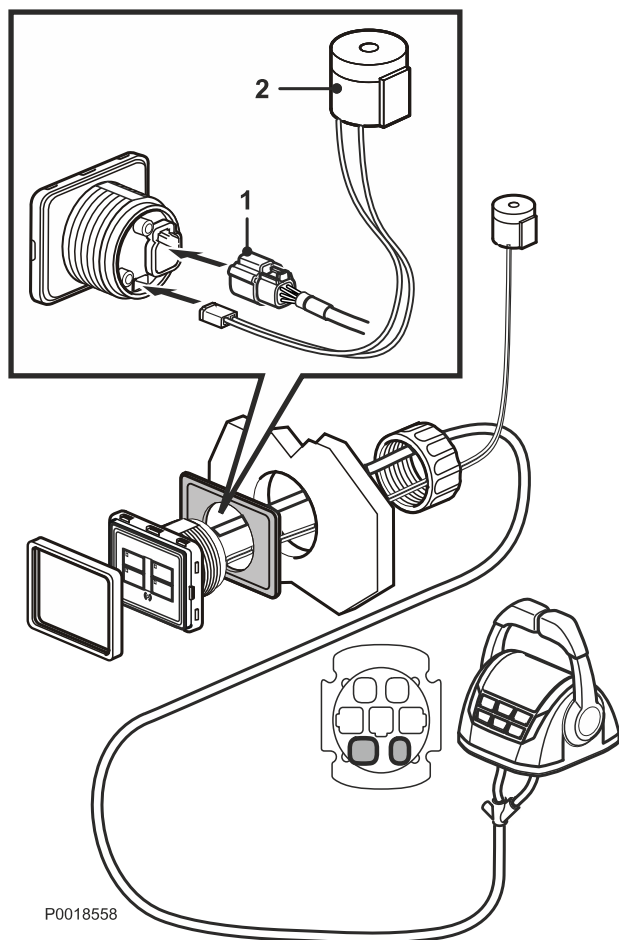


p0013837



P0016313

e-Key panel and key fob



P0018558

e-Key

The system consists of a key panel and key fob. The key fob is held in front of the panel to unlock the boat's EVC system. There are ignition and Start/Stop buttons for each driveline.

Installation

The e-Key panel is installed on the instrument panel. Follow the installation instructions and use the templates provided with the materials kit.

Connections

Connect the wiring to the back of the unit as illustrated

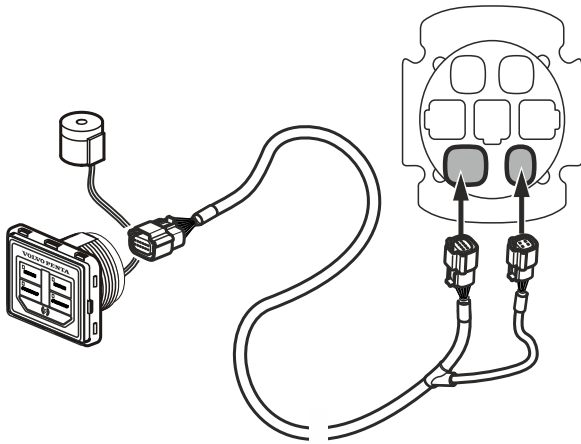
1: e-Key wiring

2: Buzzer

Tie the wiring together using cable ties.

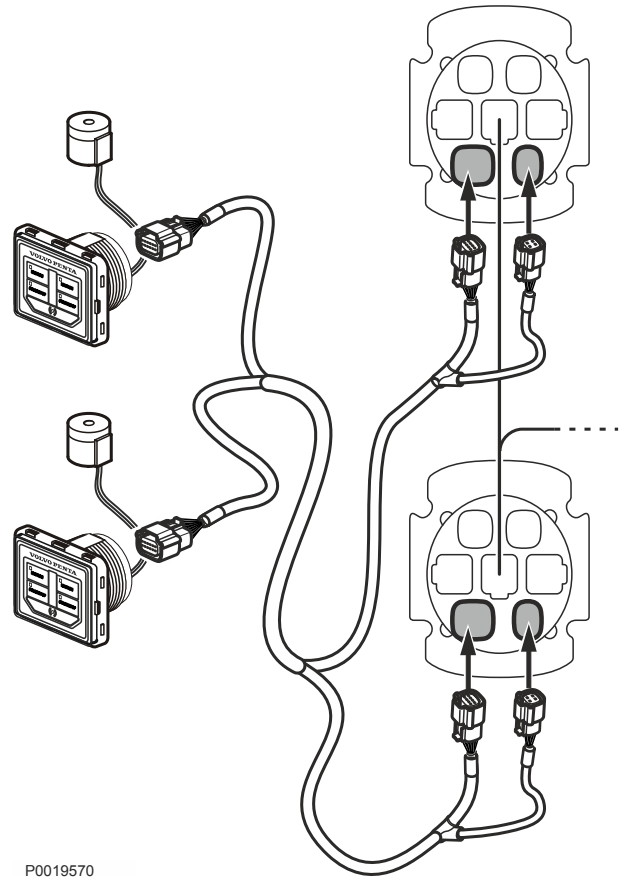
Connections; e-Key panel

Twin installation



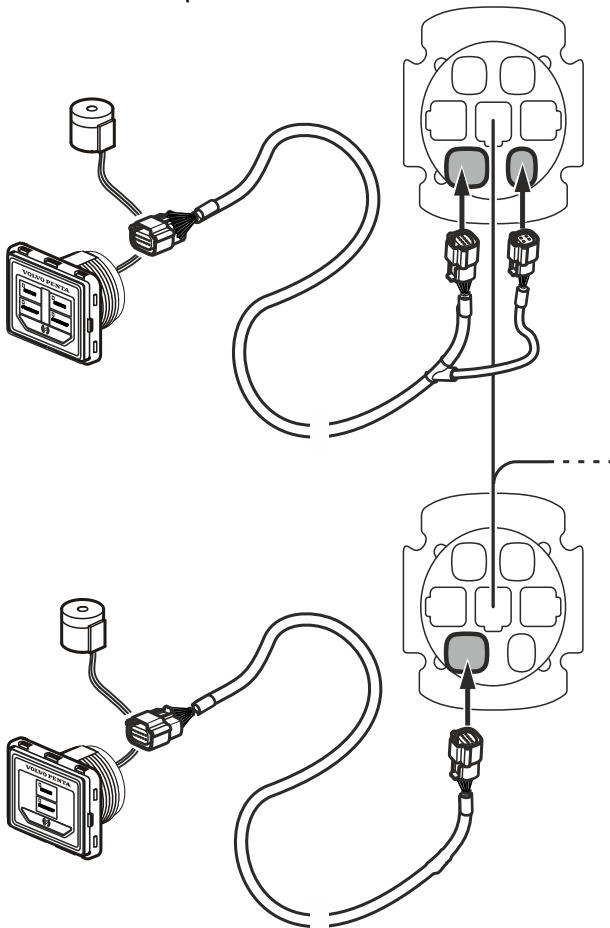
P0019568

Quad installation

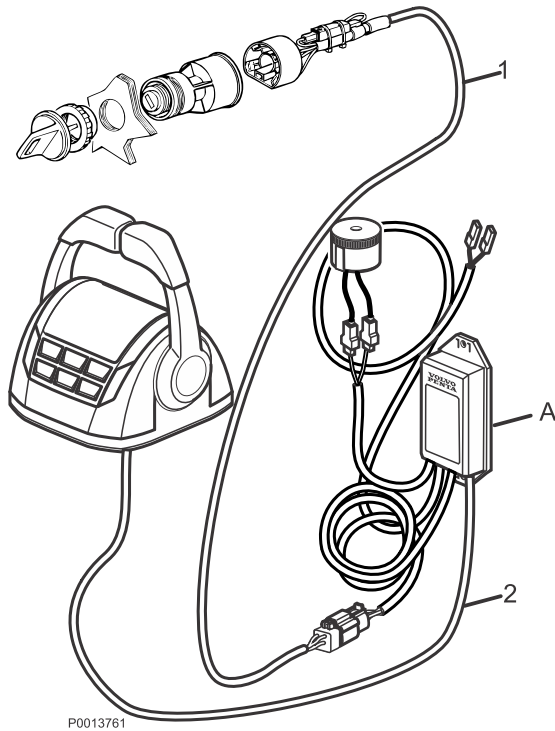


P0019570

Triple installation



P0019569



Ignition Lock

IMPORTANT!

In cases where e-Key panel is missing, there must always be a ignition key for each engine.
Start/stop panels must be used at other helm stations.

Installation

Follow the installation instructions and use the templates provided with the kit.

Connections

- 1 Connect the ignition (1) to AKI, Analog Key Interface (A).
- 2 Connect the AKI to Control/HCU connections (2).

NOTICE! For extra outlets use Volvo Penta's relay for auxiliary equipment. Refer to: *Aux. Relay Cable, 6-pin* page 78 section.

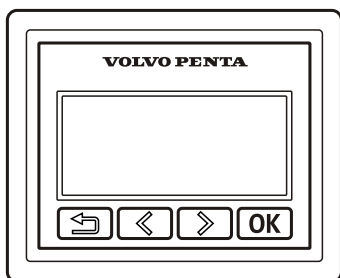
2.5" Display and Multifunction panel

2.5" Display

The minimum EVC installation requirement is one 2.5" display per driveline and helm station.

The display may be used separately or in combination with an EVC tachometer.

NOTICE! The 2.5" display cannot be used in combination with a 4" or 7" display.



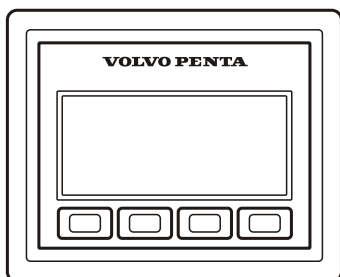
p0012720

Multi-function Panel

The dimensions are the same as the 2.5" display but lacks icons on the buttons; the function of each button is shown instead on the display.

Keypad for use with different functions such as

- Start/Stop panel
- Sport fish panel
- Docking panel
- Cruise control
- Station panel



p0012719

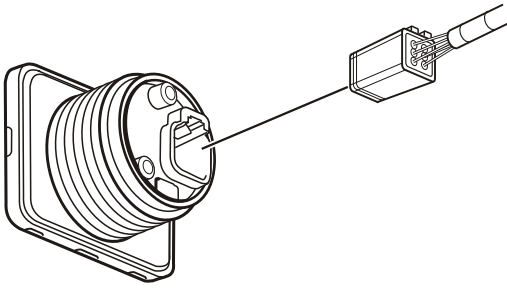
Panel type is selected during auto-configuration.

Installation

Follow the installation instructions and use the templates provided with the panels.

1 2.5" display

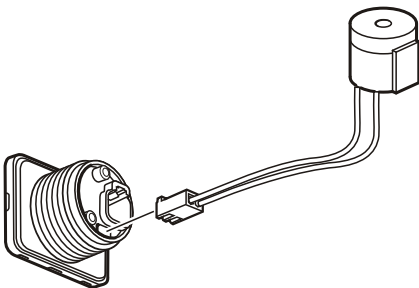
Connect a multilink cable to the back of the display.



P0017432

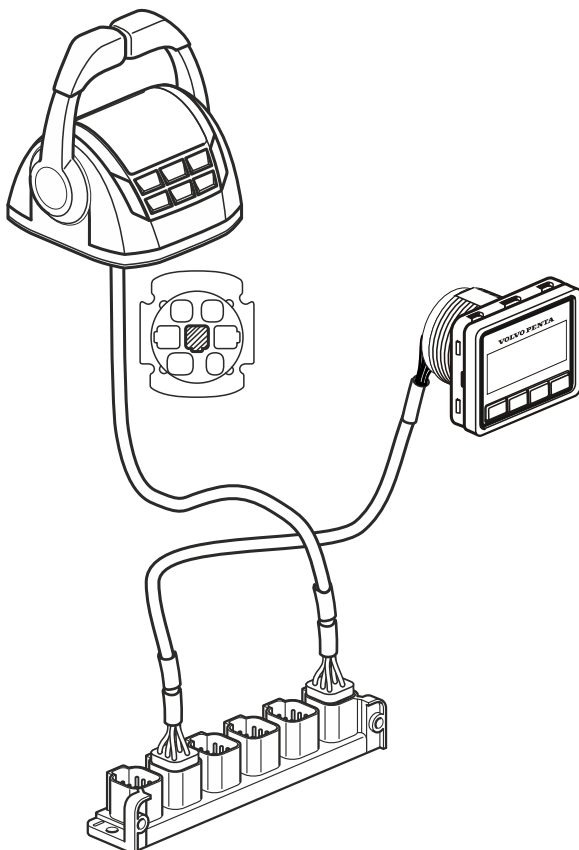
2 Multifunction panel

Connect a multilink cable to the back of the display. Secure the warning buzzer to the multilink cable with a cable tie.

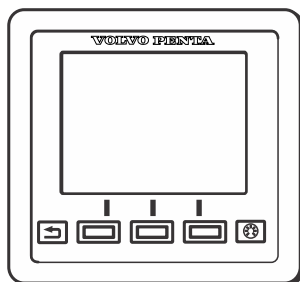


3 Place the plastic bezel over the display and press it into position. When the frame is in the correct position, a light "click" will be heard from the integrated plastic clips on the inside of the frame.

4 Connect the multilink cable to the multilink hub.



p0012865



P0017558

4" Display

The display shows information such as running data and current tank levels etc. The information available depends on engine type, the number of sensors and accessories installed.

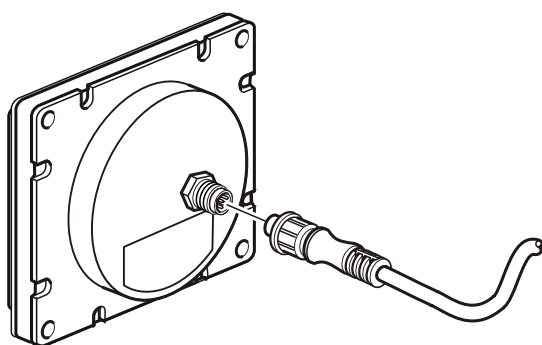
Installation

Follow the installation instructions and use the templates provided with the kit.

Connection

The kit comprises the display itself with connections and a 1.5 m (5 ft) cable. An extension cable may be connected; refer to *Extension cable, Deutsch, 6-pin* page 76.

The display may be used separately or in combination with an EVC tachometer. Also refer to *Display Options* page 60.



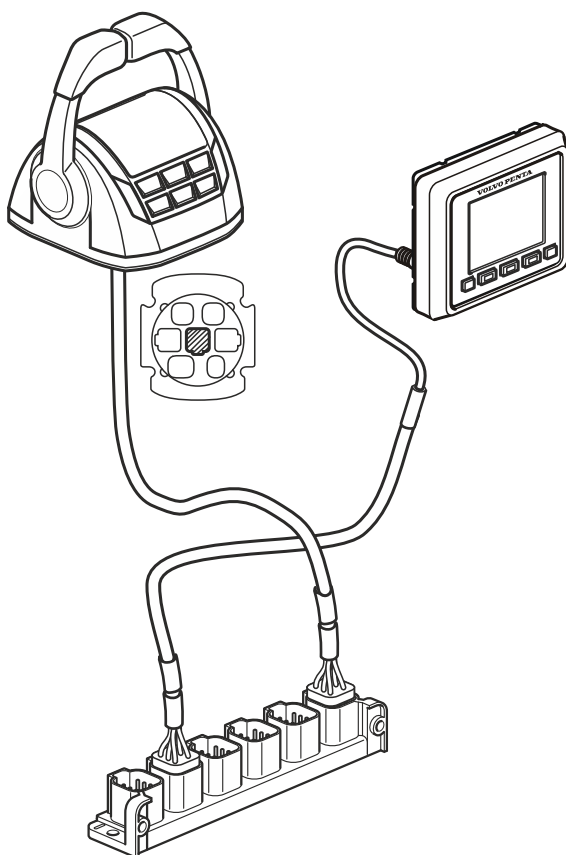
P0015619

NOTICE! The 4" display cannot be used in combination with a 2.5" or 7" display.

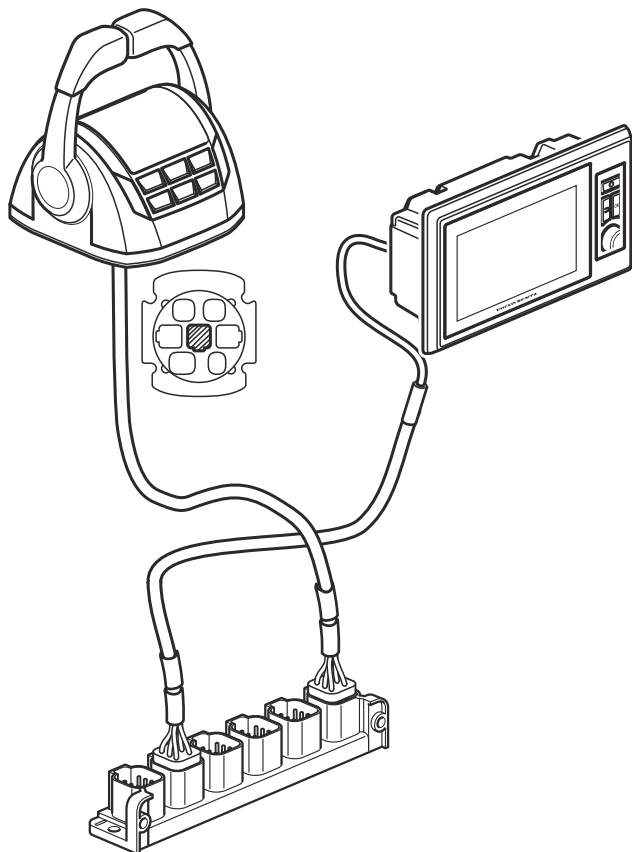
Twin installation

When two 4" displays are used in a twin installation the displays must be configured as PORT and STARBOARD respectively before auto-configuration is carried out. This is done in the settings menu.

NOTICE! Connect gauges that are shared by both engines to the port EVC tachometer.



p0018559



p0018560

7" Display

The 7" display shows all available information in digital (numerals) or analog (gauges) form. The display shows operational information, informational messages and alarms. There is also a video input for a security camera. The user selects the type of information shown by means of the display buttons. The display is able to show operational information for up to three engines simultaneously. The kit comprises the display itself with connections and a 1.5 m (5 ft) cable with a 6-pole connection. An extension cable may be connected.

NOTICE! When installing several 7" displays a Power Feed Module (PFM) must also be installed. Applies only to 12 V systems.

Installation

Follow the installation instructions and use the templates provided with the kit.

The instrument is usually installed on the instrument panel. It may either be installed from above or below, flush with the instrument panel. Installation flush with the instrument panel will require accurate cut-out measurement.

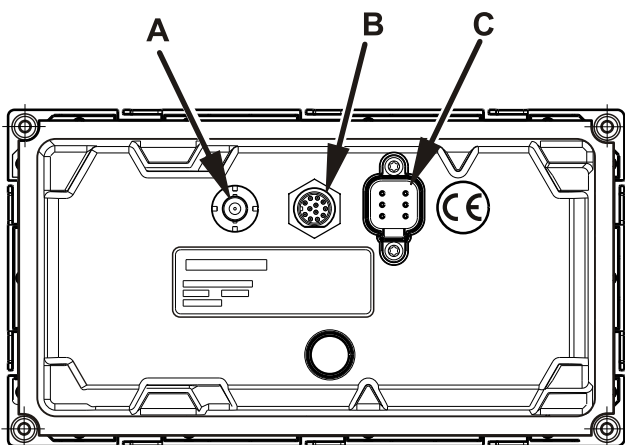
Connection

A VIDEO (IN), connection to possible camera (BNC)

B DEUTSCH IMC24- 2212X

C DEUTSCH DT15-6P, connects to multilink hub with 7" display cable (included in kit)

Refer to *Auto configuration, 7" display* page 149 for display configuration.



P0013613

Volvo Penta Glass Cockpit

NOTICE! Applies only to EVC-E2.

General

The screens show all the available information such as operations data, informational messages, alarms and multimedia. The user chooses what information will be shown and how it must be presented on screen. Up to three screens can be installed at each station.

NOTICE! It is not permitted to use Volvo Penta Glass Cockpit displays in combination with 2.5", 4" or 7" displays in the same helm station.

Touch screen (Multi Function Display, MFD)

There are 8", 12" and 15" displays available with integrated processors and charts (Worldwide Basemap or US Detailed).

The kit consists of the display itself with the processor and necessary harness for connections, SD card reader and GPS.

Installation

Follow the installation posters: *Installation Procedure: Glass Cockpit* and the installation instruction included with the kit for connection. The display is either installed from above, or from below flush with the instrument panel (flush installation not included in the kit). The 8" and 12" displays can also be installed on the bracket included in the kit.

Connection

A NMEA 0183

B NETWORK, Garmin Marine Network, GMN

C DVI-I VIDEO OUT

D Composite BNC video in

E ENGINE, to Multilink

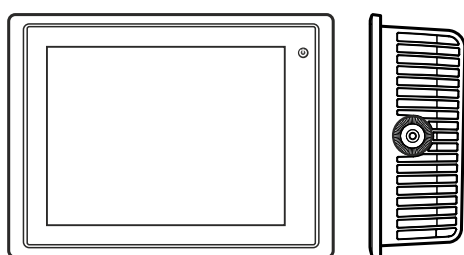
F HOUSE (not used)

G NMEA 2000

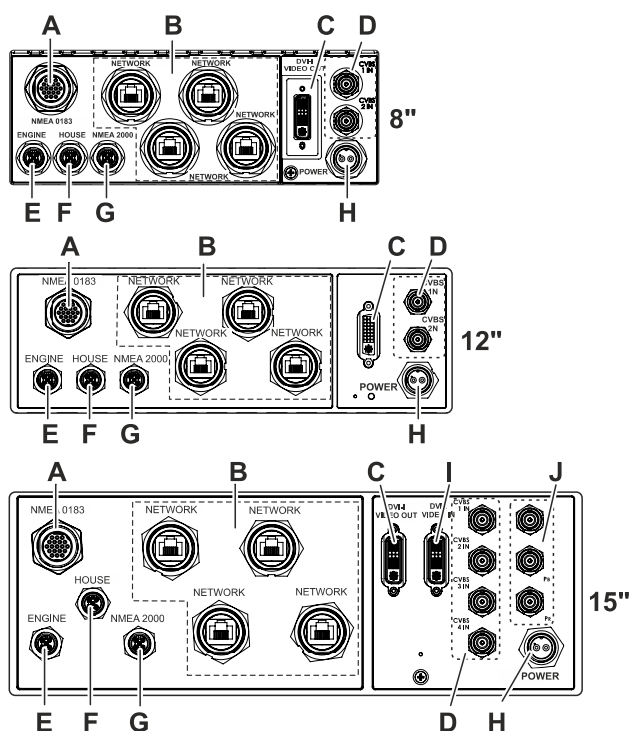
H POWER

I DVI-I VIDEO IN

J Component BNC video in



P0018850



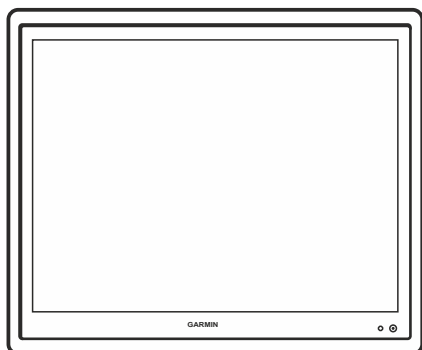
P0018823

Touch screen (Monitor) for stand-alone processor box

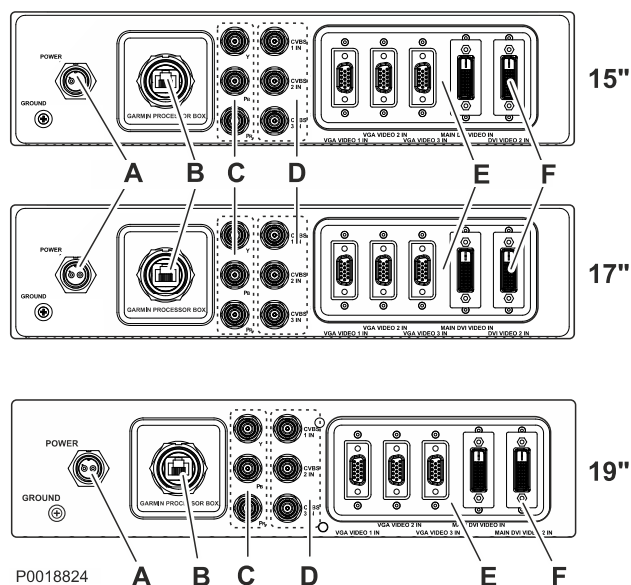
The display is available as 15", 17" and 19". The kits include harnesses for connections (NMEA2000 and display cable) and a power supply cable.

Installation

Follow the installation posters: *Installation Procedure: Glass Cockpit* and the installation instruction included with the kit for connection. The display is either installed from above, or from below flush with the instrument panel (flush installation not included in the kit).



P0018851



P0018824

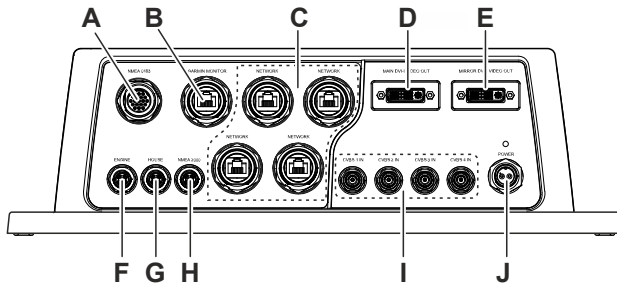
Connection, display

- A POWER
- B GARMIN PROCESSOR BOX
- C Component BNC video in
- D Composite BNC video in
- E VGA video input
- F DVI-D video input

Processor box

Choose between a Worldwide Basemap or US detailed map (BlueChart g2).

NOTICE! The SD card reader and GPS are ordered separately.



P0018852

Connection, processor box.

A NMEA 0183

B MONITOR

C NETWORK, Garmin Marine Network, GMN

D Main, DVI-I Monitor video out

E Main, DVI-I Monitor video out

F ENGINE, to Multilink

G HOUSE (not used)

H NMEA 2000

I Composite BNC video in

J POWER

Refer to *Volvo Penta Glass Cockpit, calibration* page 181 for autopilot configuration.

Gauges

NOTICE!

- Always connect gauges that are shared by both engines, e.g. speedometer, rudder indicator, etc. to the port EVC tachometer.
The port engine is always the master engine in an EVC system.
- Maximum center-to-center distance between gauges without extension cables is 220 mm (8.6").
- Always select appropriate, dry locations for gauges.

Installation

Follow the installation instructions and use the templates provided with the gauges.

Optional Gauges

EVC tachometer

An EVC system tachometer (rpm) is recommended as standard for all installations. The tachometer has an integral alarm buzzer, an LCD and an output to the instrument series bus (EasyLink). The LCD shows engine hours, warnings/alarms and popups.

Ø 85 mm (3.35")

Ø 110 mm (4.33")

NOTICE! It is only possible to connect one tachometer per engine at one helm station.

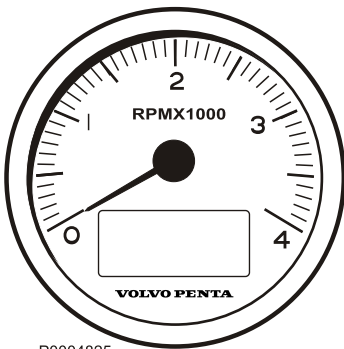
EVC speedometer

Unitless speedometer. Only in combination with an EVC tachometer. Desired unit (knots, km/ h); for setting units refer to *Units page 153*.

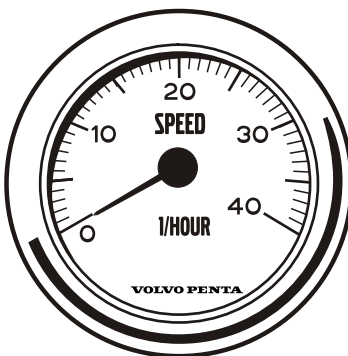
Ø 85 mm (3.35")

Ø 110 mm (4.33")

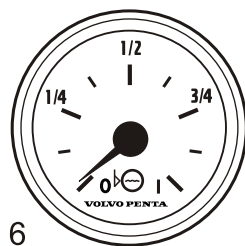
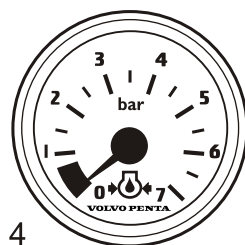
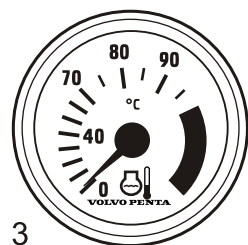
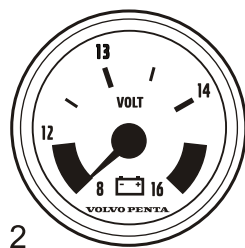
NOTICE! Only in combination with an EVC tachometer.



P0004825

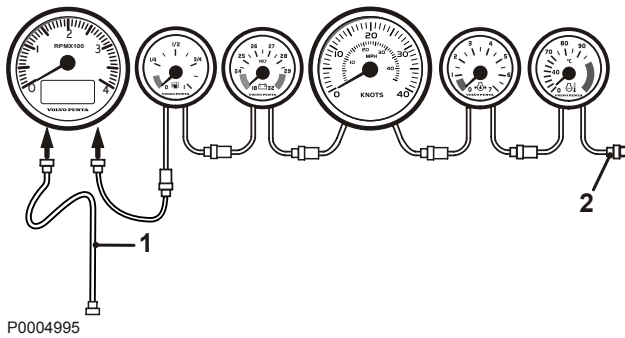


P0006659



- 1 Fuel level Ø 52 mm (2.05")
- 2 Battery Voltage (12V/24V), Ø 52 mm (2.05")
- 3 Coolant Temperature (°C/°F), Ø 52 mm (2.05")
- 4 Oil Pressure (bar/psi), Ø 52 mm (2.05")
- 5 Freshwater level Ø 52 mm (2.05")
- 6 Rudder indicator
- 7 Alarm Display

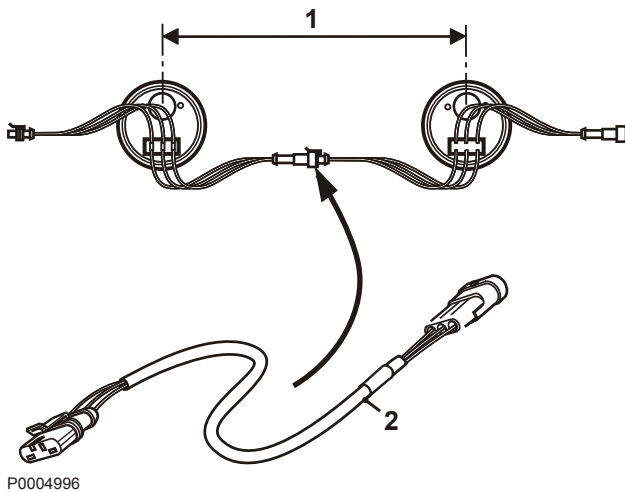
P0005255



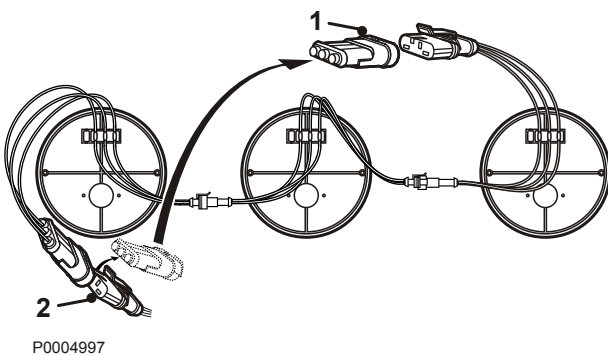
Connecting the instruments

Connect the other instruments together and to the EVC tachometer with the 3-pole extension cable.

- 1 Multilink cable
- 2 Protective plug



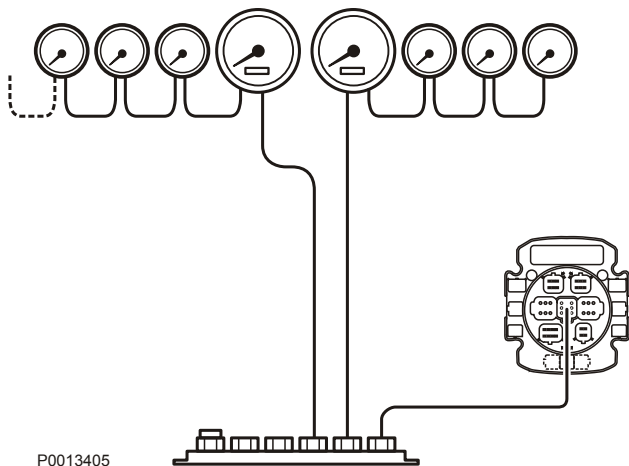
NOTICE! If the distance between the gauge (1) is greater than 220 mm (8.7"), an extension harness must be used.



IMPORTANT!

Always plug open instrument cable connectors to avoid corrosion; use the end plug attached to the cable.

- 1 Protective plug
- 2 Connection, EVC tachometer

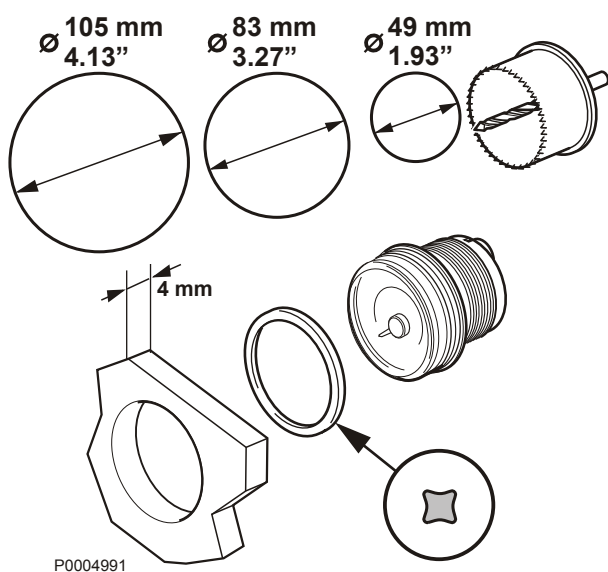


Connect the EVC cable to the multilink hub with the aid of a multilink cable; refer to the illustration.

Flush mounted instrument

NOTICE! The hole diameter must be 83 mm (3.27") or 49 mm (1.93").
Recess depth must be 4 mm (0.16").

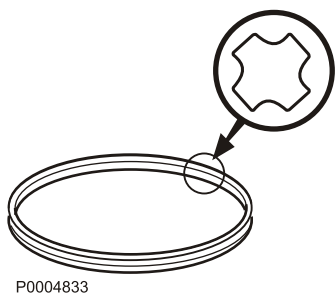
- 1 Cut out a Ø49 (1.93"), Ø83 (3.27") or Ø105 mm (4.13") hole depending on instrument type.
- 2 Fit a seal ring (X-ring) between the instrument panel and the gauge.
- 3 Install the gauge as illustrated.



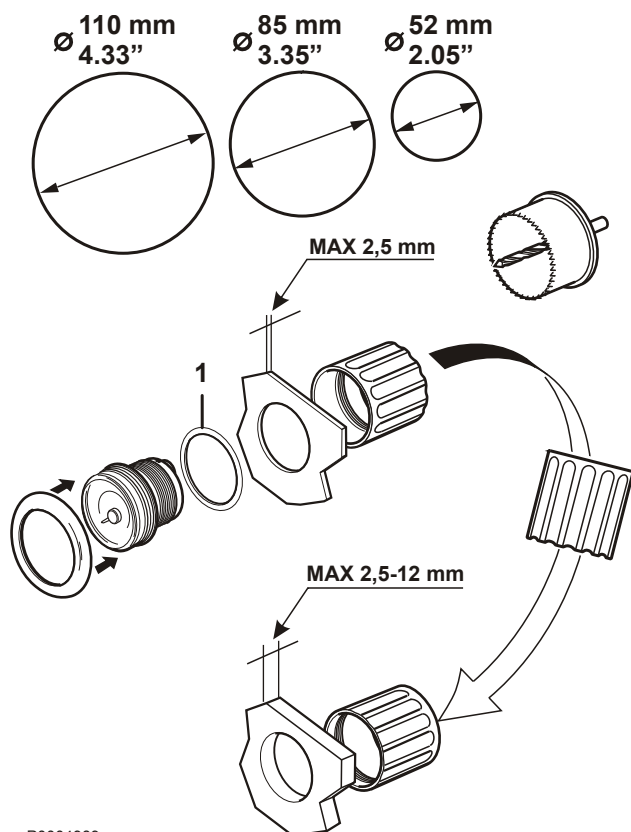
EVC instrument gaskets

Gasket for mounting flush with the instrument panel

If the instrument is to be mounted flush with the instrument panel a gasket must be used to prevent water getting behind the panel.



Instruments with mounting sleeve



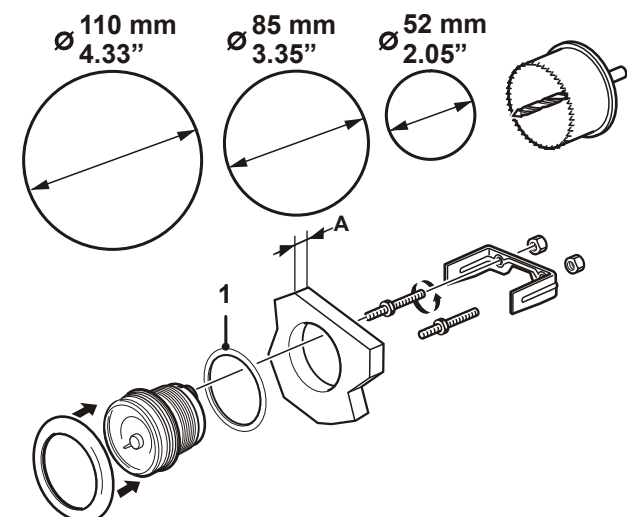
P0004989

NOTICE! Use installation sleeves when the instrument panel is max 12 mm (0.5") thick. Refer to Gauges with installation clamps on the following page if the instrument panel is thicker than 12 mm (0.5").

- 1 Cut out a Ø52 (2.05"), Ø85 (3.35") or Ø110 mm (4.33") hole depending on instrument type.
- 2 Install the gauge as illustrated. Locate the gasket (1) between the gauge and the instrument panel.

NOTICE! The installation sleeve has a different alignment if the instrument panel is thicker than 2.5 mm (0.01").

Instruments with mounting brackets



P0006686

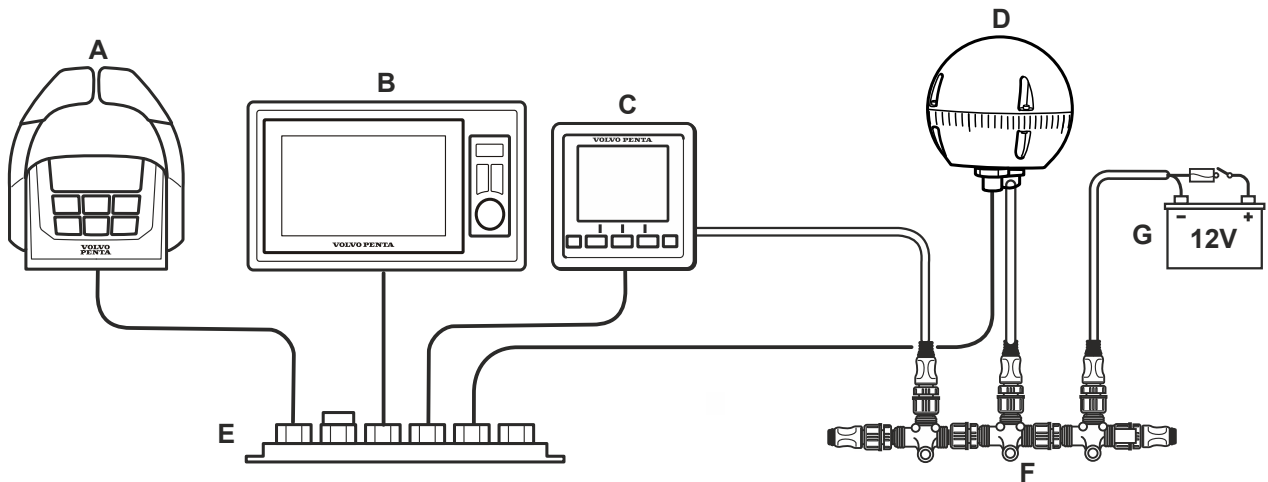
NOTICE! Mounting brackets are used where instrument panels are between 12 mm (0.5") and 25 mm (1") mm thick. If the instrument panel is thinner than 12 mm (0.5"), refer to *Gauges with installation sleeves*.

- 1 Cut out a Ø52 (2"), Ø85 (3.4") or Ø110 mm (4.3") hole depending on instrument type.
- 2 Install the gauge as illustrated. Locate the gasket (1) between the gauge and the instrument panel.

Autopilot

The Volvo Penta Autopilot constantly adjusts steering to hold the boat on a straight course. Several different steering patterns can be entered and the autopilot also permits manual steering. The autopilot consists of a **compass (CCU)** and an **Autopilot 4" display**. These are delivered in separate kits. Follow the installation instructions and use the templates provided.

Refer to *Autopilot page 176* for calibration.

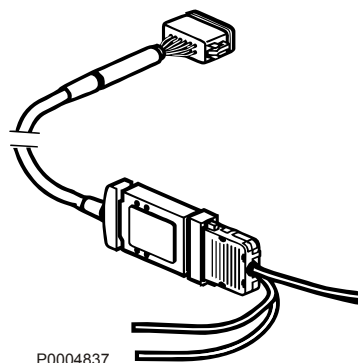


P0019807

Components shown in diagram

- A Controls
- B 7" Display
- C Autopilot 4" display
- D Compass (CCU)
- E Multilink hub
- F NMEA2000 backbone
- G Battery

Interface

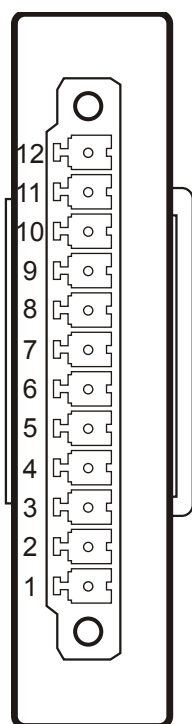


Interface 4–20 mA

Input data interface 4–20 mA

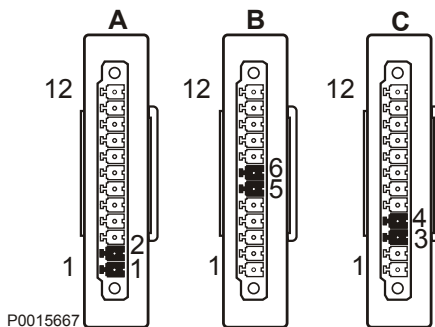
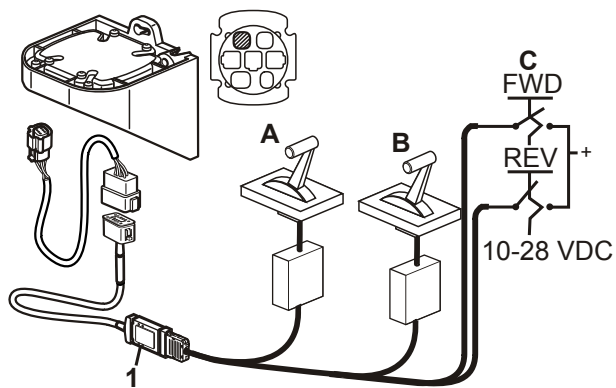
Input data interface for aftermarket control systems with support for 4–20 mA. No calibration necessary. The interface functions with both 12 V and 24 V installations.

NOTICE! AB Volvo Penta has developed and tested the entire EVC system and its components. However, components supplied from manufacturers other than Volvo Penta, or components incorrectly installed, may cause the system to work incorrectly. Volvo Penta will not accept any liability in such cases.



- Pin 12: – Negative
- Pin 11: + 10–28 VDC
- Pin 10: CLOSED: Output signal (7-8)
- Pin 9: OPEN Input signal (1-6)
- Pin 8: – Trolling output 4–20 mA (200–600 ohm)
- Pin 7: + Trolling output 4–20 mA (200–600 ohm)
- Pin 6: – Trolling 4–20 mA (200 ohm)
- Pin 5: + Trolling 4–20 mA (200 ohm)
- Pin 4: BACK 10–28 VDC = gear indication
- Pin 3: FORWARD 10–28 VDC = gear indication
- Pin 2: – Throttle control 4–20 mA (200 ohm)
- Pin 1: + Throttle control 4–20 mA (200 ohm)

NOTICE! If a manual/mechanical emergency gear is installed in the reverse gear, a neutral switch must also be installed for the Deactivate drive function. (Open in the neutral position).



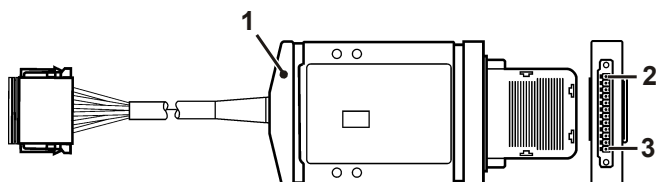
P0015667

1 Interface

A Throttle control

B Trolling control

C Reverse gear



P0006130

1 Interface

2 Pin 12

3 Pin 1

Interface, input

No calibration required for aftermarket systems that support 4–20 mA.

The following functions are available:

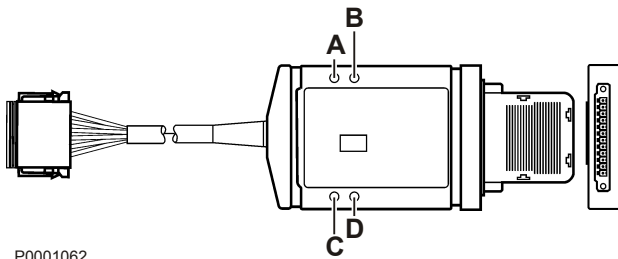
- Throttle control
- Trolling function
- Gear shift/reverse gear

NOTICE! The trolling functions need not be connected if only throttle control is required.

NOTICE! The specified input signal levels are required for the interface to work correctly.

Installation sequence

- 1 Connect the control harness to the interface screw terminal (1).
- 2 Install the strain relief supplied.
- 3 Connect the interface to the Stand-alone HCU via an adapter cable.
- 4 Secure the interface in a suitable place, using a cable tie or screw.
- 5 Carry out system auto-configuration; refer to *Auto configuration, single installation* or *Auto configuration, twin installation* page 142.



Diode indication, interface input

Throttle diode (A)

Constant light	Input signal is valid, i.e. between 2.0 - 22,0 mA
Flashes (10 Hz)	Input signal is < 2.0 mA or > 22.0 mA
Extinguished	Other cases

Trolling diode (B):

Constant light	Input signal is valid, i.e. between 2.0 - 22,0 mA
Flashes (10 Hz)	Input signal is < 2.0 mA or > 22.0 mA
Extinguished	Other cases

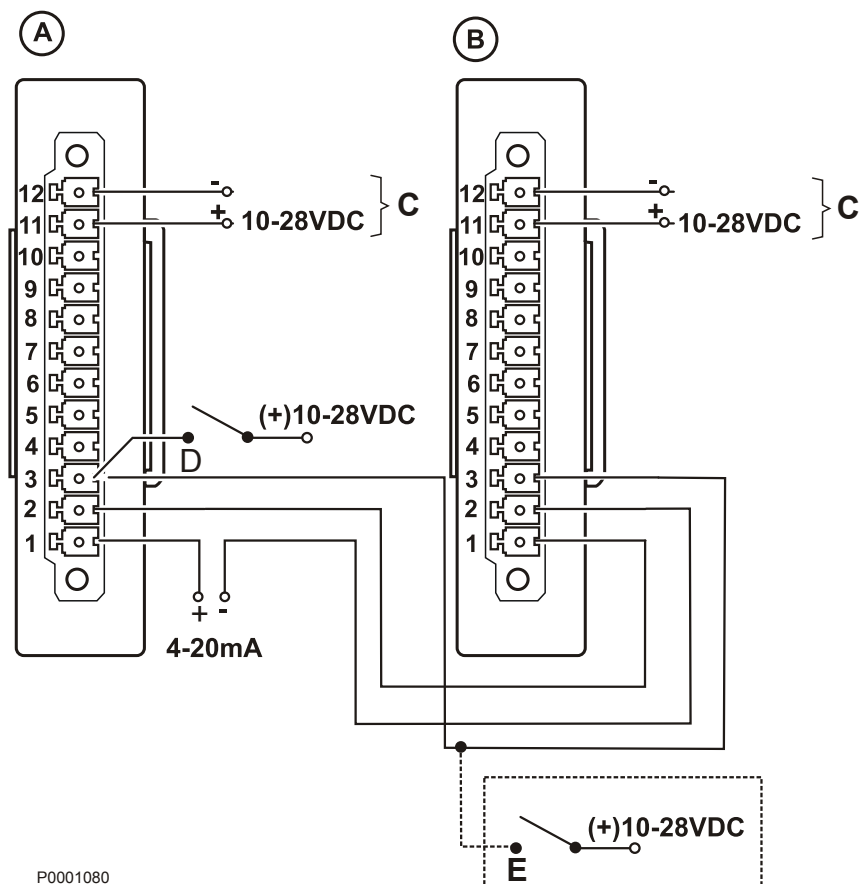
Power supply diode (C):

Flashes (10 Hz)	The unit has power supply
Extinguished	Other cases

Gear shift diode (D):

Constant light	Input signal for Reverse or Forward is > 6 V
Flashes (10 Hz)	Input signals for Reverse and Forward are > 6 V (simultaneously)
Extinguished	Other cases

Installation example, throttle control



P0001080

- A Main helm station
- B Secondary helm station
- C Battery supply from main switch (not via relay for external accessories)
- D Neutral position (open in the neutral position).
- E If a manual/mechanical emergency gear is installed in the reverse gear, a neutral switch must also be installed for the Deactivate drive function. (Open in the neutral position).

Main helm station

- 1 Connect Throttle IN to pin 1 (+) and pin 2 (-).

IMPORTANT!

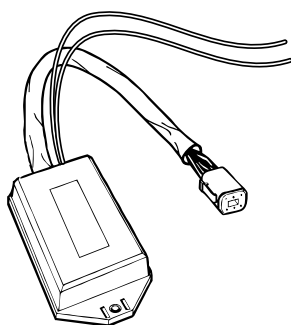
The interface always requires current and a correct 4.0–20.0 mA throttle signal before the EVC system is started.

NOTICE! The EVC system also requires an input signal for the neutral switch for deactivate drive and wide open throttle (WOT).

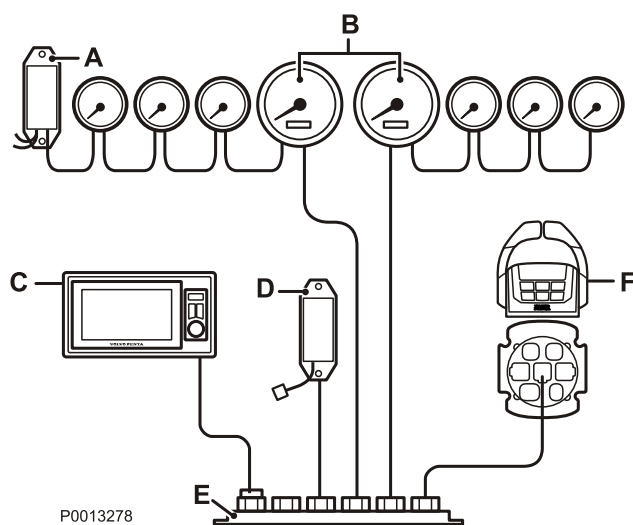
If the drive input signal (VDC) is not connected, engine rpm will be limited to “warm-up rpm only”.

Secondary helm station

- 1 Connect the main helm station throttle signal (IN) in series with the throttle signal (IN) at the secondary helm station.
- 2 Otherwise the same requirements apply as for the main helm station.



P0004840



P0013278

NMEA0183 interface

Transfers information about boat speed from a GPS or equivalent; the information is shown in gauges, the 2.5", 4" or 7" display.

An NMEA interface/multisensor must be installed to transfer the information to the EVC system.

IMPORTANT!

It is not permitted to install both an NMEA 0183 interface and an NMEA 2000 in the same boat.

NOTICE! Only one NMEA interface per boat is possible.

Installation and connection of the NMEA interface

A ADU

B EVC tachometer and other instruments

C 7" display

D NMEA Interface

E Multilink hub

F Control with HCU.

- 1 Connect the NMEA interface and the 7" display to the multilink hub.
- 2 Connect the control to the multilink hub using a multilink cable.

If a speedometer is used it must be connected in the same way as all other gauges.

The NMEA unit LEDs flash at different frequencies to define different functions. Carry out and confirm connections in the following sequence.

Constant light – power supply available, but no NMEA connection. The NMEA unit may be incorrectly connected.

3-pulse flash – power supply and NMEA data connection established and confirmed.

Flashing – power supply and NMEA and CAN bus connection established and confirmed. The function is fault free.

NMEA messages

Ground speed

Data is collected from an NMEA 0183 unit and VTG message.

Speed through water

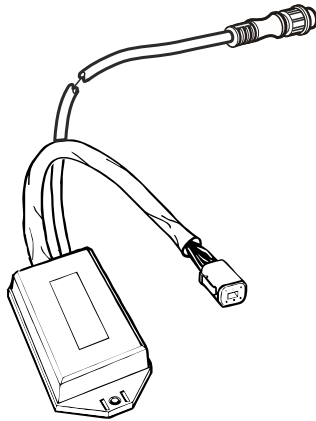
Data is collected from an NMEA 0183 VHW message.

NOTICE! "Ground speed" has higher priority than "Speed through water".
"Ground speed" is displayed when both parameters are available.

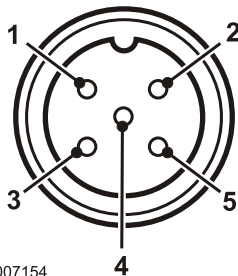
NMEA2000 interface

Transfers engine data to equipment compatible with an NMEA 2000 from another supplier. Information about boat speed from a GPS or equivalent is shown in gauges, the 2.5", 4" or 7" display.

An NMEA interface/multisensor must be installed to enable speed information delivery to the EVC system.



P0018565

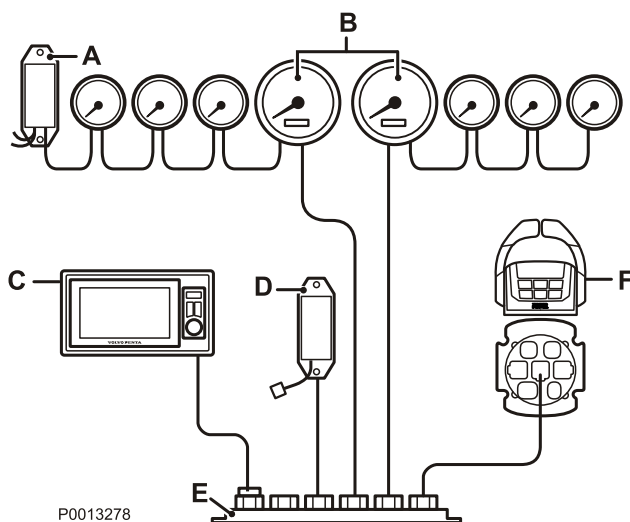


P0007154

- 1 Not connected
- 2 Red, supply +
- 3 Yellow, CAN high
- 4 Blue, CAN low
- 5 Black, supply –

Connector type: Device Net Micro-C Male

Installing and connecting an NMEA interface



P0013278

A ADU

B EVC tachometer and other instruments

C 7" display

D NMEA Interface

E Multilink hub

F Control with HCU

- 1 Connect the NMEA interface and the 7" screen to a socket on the multilink hub.
- 2 Connect the control to the multilink hub using a multilink cable.

NOTICE! Only one NMEA interface per boat is possible.

LED for NMEA 2000 diagnostics

Constant light	The unit is switched on but there are no signals from any direction.
Flashes at 0.5 second intervals	The unit is transmitting and receiving applicable NMEA and MULTILINK data. The function is fault free.
Flashes twice followed by a pause (recurring)	The unit is receiving MULTILINK data but has no NMEA connection.
Flashes three times quickly and is then extinguished (repeatedly)	The unit is receiving NMEA data but has no MULTILINK connection.

Parameters

The NMEA interface supports the following NMEA 2000 parameters. The number of parameters generated depends on the engine system.

Output data signals

Engine parameters, quick PGN 127488	<ul style="list-style-type: none"> - Engine speed - Boost pressure (only if sensor is installed) - Power Trim position (only if sensor is installed)
Engine parameters, dynamic PGN 127489	<ul style="list-style-type: none"> - Lubricating oil pressure (only if sensor is installed) - Engine oil temperature (only if sensor is installed) - Coolant temperature (only if sensor is installed) - Battery voltage - Average fuel consumption - Engine operating hours - Coolant pressure (only if sensor is installed) - Fuel feed pressure (only if sensor is installed) - High coolant temperature - Low oil pressure - Low oil level - Low battery voltage - Low coolant level - Water in fuel
Drive train parameters, dynamic PGN 127493	<ul style="list-style-type: none"> - Oil pressure, power train (only if sensor is installed) - Oil temperature, power train (only if sensor is installed)
Fluid level PGN 127505	<ul style="list-style-type: none"> - Fuel level (only if sensor is installed) - Freshwater level (only if sensor is installed)
Rudder PGN 127245	<ul style="list-style-type: none"> - Rudder position (only if sensor is installed)
Actual speed PGN 128259	<ul style="list-style-type: none"> - Speed through water (only if sensor is installed)
Water depth PGN 128267	<ul style="list-style-type: none"> - Water depth (only if sensor is installed)
Ambient parameters PGN 130310	<ul style="list-style-type: none"> - Water temperature (only if sensor is installed)

Input signals from NMEA 2000

Speed PGN 128259 - Speed through water

COG & SOG Rapid PGN - Ground speed

129026 - Course over ground

- Reference course over ground

Vessel heading PGN 127250 - Boat heading

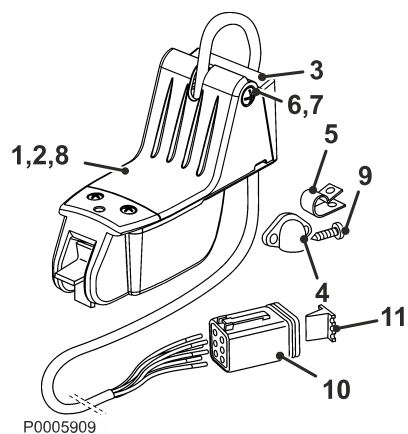
- Sensor reference

Sensor

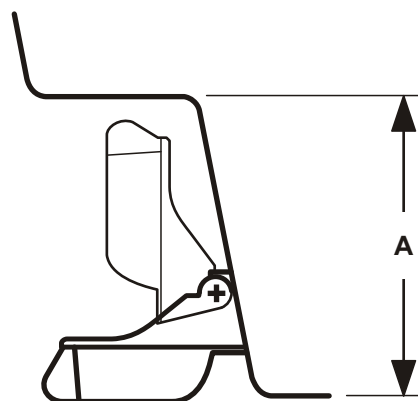
Multisensor

NOTICE! Refer to the installation instructions supplied with the multisensor materials kit for a complete description of installation and testing.

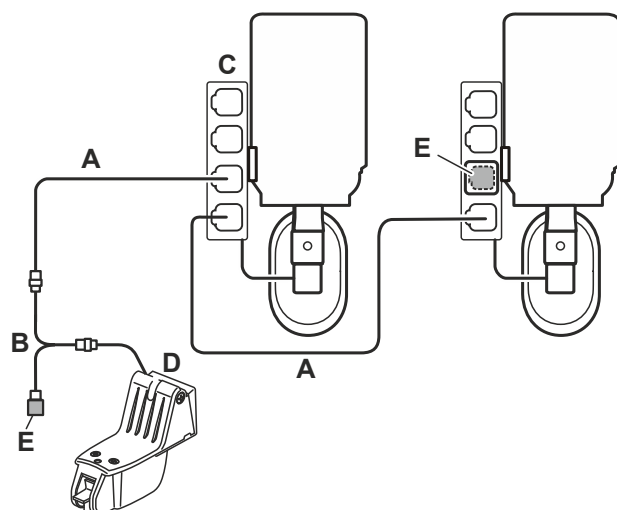
- Connect the multisensor to the AUX bus via Y-split, multisensor.
- Always connect gauges and sensors that are shared by both engines, e.g. speedometer, rudder indicator etc., to the port engine/EVC tachometer. The port engine is always the master engine in an EVC system.
- If a multisensor and an NMEA interface are installed, only ground speed will be shown by the speedometer and the display.
- Frequency: 235 kHz.

**Transom-mounted sensor**

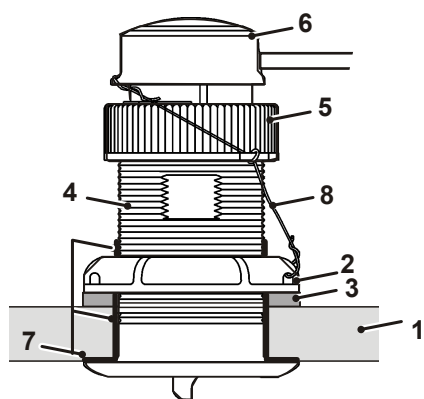
- 1 Sensor
- 2 Bracket
- 3 Spacer (9°)
- 4 Grommet
- 5 Cable clamps
- 6 Nut
- 7 Bolt
- 8 Self-tapping screw
- 9 Self-tapping screw
- 10 6-pole connector
- 11 Connection wedge



A: Required clearance: 130 mm



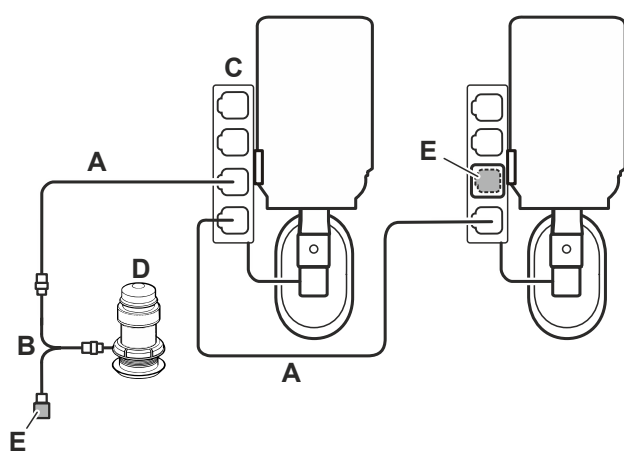
- A Standard EVC bus cable
- B Y-split, multisensor
- C Engine connector strip
- D Transom-mounted sensor
- E Terminal plug



P0005910

Hull-mounted sensor

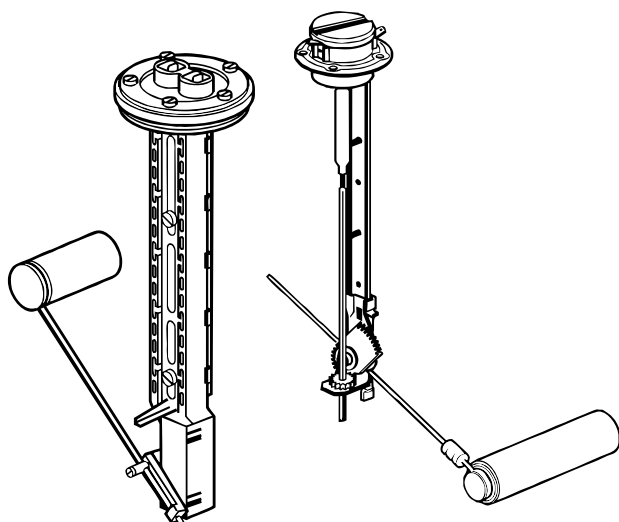
- 1 Hull
- 2 Hull nut
- 3 Washer
- 4 Sensor housing
- 5 Cap nut
- 6 Insert
- 7 Marine sealant
- 8 Safety wire



P0019519

- A Standard EVC bus cable
- B Y-split, multisensor
- C Engine connector strip
- D Hull-mounted sensor
- E Terminal plug

Sensor, fuel- and fresh water level



P0008462

Sensor for fuel and freshwater

Volvo Penta level sensors for fuel and freshwater are suitable for tanks with a maximum depth of **600 mm (23")**. If the tank is deeper a different sensor may be used; note that sensor resistance must be within the range specified below.

The levels in the fuel and freshwater tanks can be shown on a 2.5" display, 4" display and 7" display or in separate gauges.

The engine has a separate harness with connections for sensors..

Fuel (two types of sensor)

3–180 ohm, 3 ohm = empty tank

(240-30 ohm, 240 ohm = empty tank)

Fresh water

3–180 ohm, 3 ohm = empty tank

IMPORTANT!

Make sure to select the correct sensor. The fuel level sensor may never be used as a freshwater level sensor as this may cause corrosion problems.

NOTICE! For fuel level sensor calibration and tank level alarm setting, refer to *Fuel tank settings page 159*.

The default low fuel level alarm setting is 0 % of tank volume.

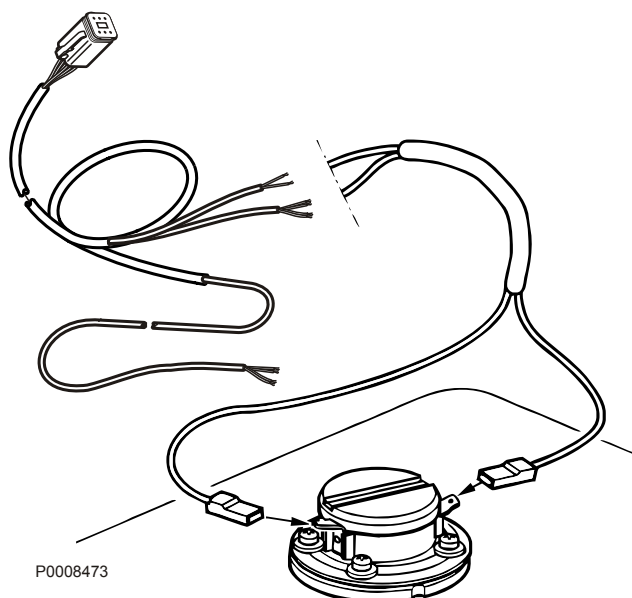
Installation

Follow the installation instructions provided with the kits for each level sensor.

Connections

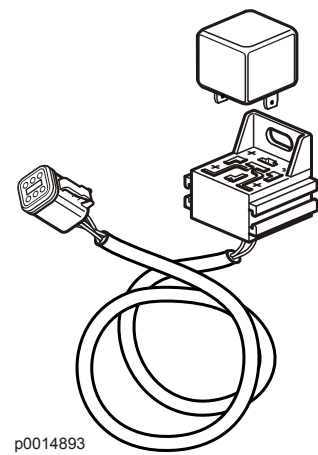
- 1 The level sensor is connected to the EVC system via the sender cable to the engine connector marked **SENDERS**.
- 2 Fuel level sensor: Connect the black cable to the connection pin marked \perp (ground) and the green/black cable to the other pin.
Fresh water level sensor: Connect the blue cable to the connection pin marked \perp (ground) and the blue/black cable to the other pin.

NOTICE! The fuel level sensor must be connected to the port engine.



P0008473

Optional Equipment



Relay for external accessories

The EVC architecture is ready to support a relay that provides auxiliary equipment with power when the ignition is switched on.

Relay	Engine
12 V, 20 A	D4, D6
24 V, 20 A	D6, D11, D13

IMPORTANT!

Never connect any external accessories directly to the EVC system. Always use a relay.

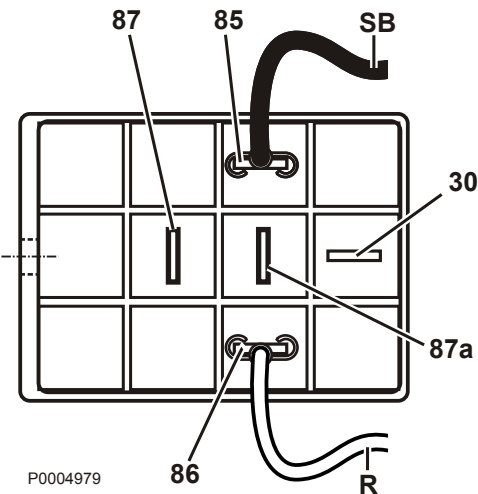
The relay controls power supply to external accessories. The relay is normally open and power is cut when ignition is off.

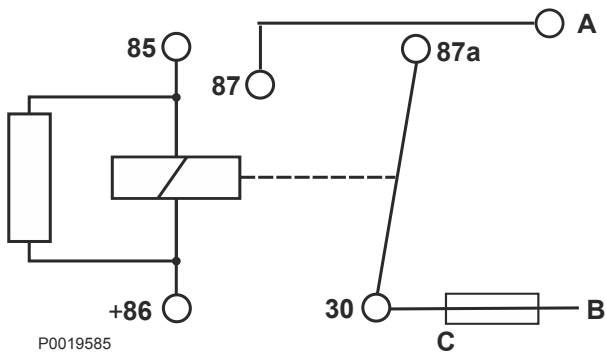
The relay cable and the relay may also be connected to a secondary helm station. In such installations the relay is energized when ignition is on at the main helm station.

NOTICE! Because the relays are connected to the multilink, they will be in operation when the ignition is on. In twin installations the relays are energized when ignition is on in either of the drivelines; however, the relays remain energized until the ignition in both drivelines is switched off.

Connections in the relay socket

Connections 85 and +86 are connected to the EVC harness. The illustration shows an ignition switch in the OFF position and the relay in the open position. Connect battery power supply for external accessories to terminal 30 on the relay socket.





- A Power supply to accessories
- B Battery supply (+)
- C Fuse

Circuit diagram, relay

Connect the external accessory to pin 87, which is energized when the ignition is in the ON position.

The cables from the battery to the relay and from the relay to the accessories must be dimensioned according to the presumed maximum current. There must also be a circuit breaker between the battery and the relay, as close to the battery as possible. Maximum current through the relay is 20 A.

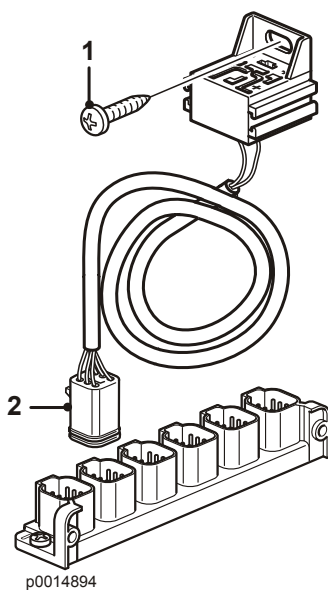
Maximum output

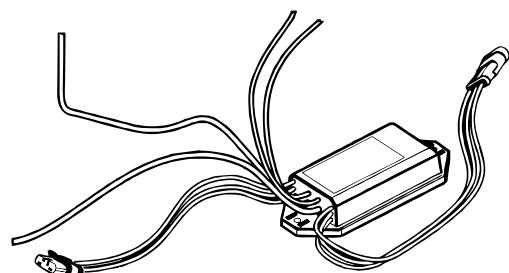
12 V – 240 W

24 V – 480 W

Installation and connection

- 1 Install the socket in a suitable place using a screw (1) as illustrated.
- 2 Connect the connector (2) to the multilink hub.





P0004834

ADU (Auxiliary dimmer unit)

Dimmer for instrument lighting for auxiliary gauges and equipment. Instruments that are not supported by the EVC system (third party instruments). This function is controlled by the multi-function panel, the 2.5" display or the dimmer button on the 4" or 7" display.

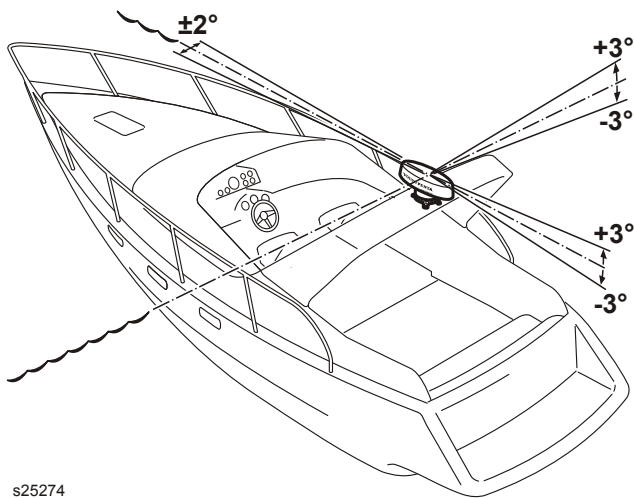
If the existing installation comprises instruments of non-EasyLink type, an ADU may be installed. This means that it is possible to control instrument lighting intensity even if instruments are of non-EasyLink type. The ADU may be installed anywhere in the chain of other EasyLink-type instruments.

Follow the installation instructions supplied with the kit.

Dynamic Positioning System (DPS)

Installation

Follow the installation instructions and use the templates provided with the kit.



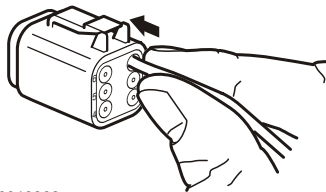
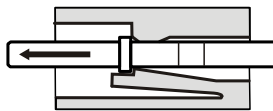
s25274

Connecting the DPS antenna connector

- 1 When the cable run is finished, expose the cable wires by carefully removing the shrink tubing at the cable end.
- 2 Hold the wire approximately 25 mm (1") behind the terminal pin. Hold the back edge of the connector with the rubber seal toward you, as illustrated.

NOTICE! The back of the connector is numbered to receive 6 connector pins. (6 pole)

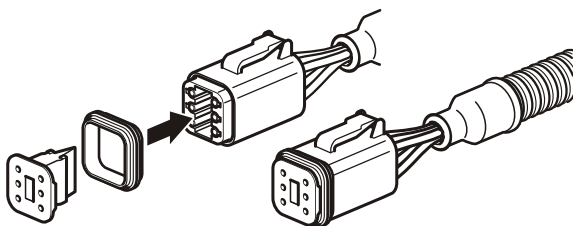
- 3 Connect the cable pins according to the cable colors in the table below.



p0013868

Pin	Cable color	Description
Pin (1)	-	-
Pin (2)	Green	CAN signal, positive
Pin (3)	Dark gray (Al)	Cable screening
Pin (4)	Black	Negative feed -
Pin (5)	White	CAN signal, negative
Pin (6)	Red	Positive feed +

- 4 Press the connector pins through the rubber seal and in to the connector housing as illustrated, until the latch clicks.
- 5 When all wires are in place, the latches must be wedged. Press the wedge (G) and seal ring (H) into the connector as illustrated.



P0013860

Calibration and Settings

General

- When the installation is complete, auto-configuration and calibration of the controls must always be carried out. Keys must be added to the system.
- Auto-configuration means that the system detects and defines all the components connected to it.
- Perform the calibrations according to the order in this manual.
- Auto-configuration must always be carried out when any changes are made to the EVC system, e.g. if the system is extended or modified.
- During control lever calibration, lever settings and idle rpm are defined for the EVC system. If a control lever is replaced, the new one must be calibrated.
- The engine cannot be started until keys are added to the system.

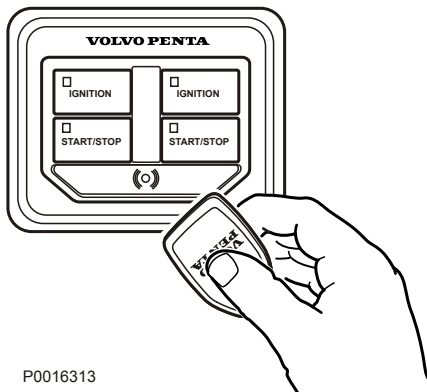
NOTICE! Not all steps are shown for new installations. These exceptions are marked by asterisks (*) in the illustration sequences.

e-Key

The key fob is held in front of the panel to unlock the boat's EVC system. There are ignition and Start/Stop buttons for each driveline.

The system has autostart, which means the button need only be pressed once to start the engines.

The system will attempt to start the engines for a maximum of 10 seconds after which the starter motor circuit is broken to protect the starter motor from overheating. If possible, allow the starter motor to cool for at least five minutes before making a new start attempt.

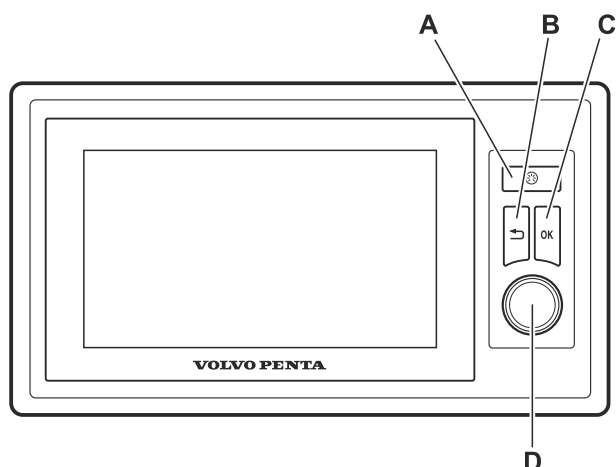


P0016313

Displays

7" display

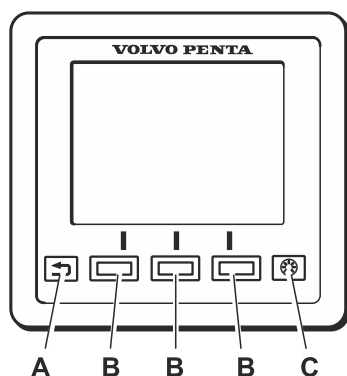
- A.** Controls instrument lighting.
- B.** Press to go back in the menu.
- C.** Confirm selection. Open sub menus and the *Settings* menu.
- D.** Turn to scroll through the menus.



P0017900

4" display

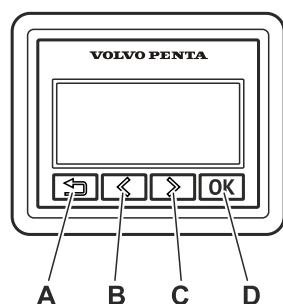
- B.** Press to go back in the menu.
- B.** Button functions are shown on screen; they change according to the menu selection.
- C.** Controls instrument lighting.



P0017914

2.5" display

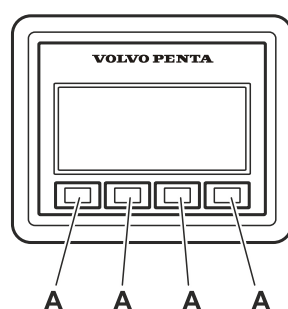
- B.** Press to go back in the menu. Press repeatedly to return to the main menu; alternatively, hold down the button for a couple of seconds.
- B.** Go left or up in the menu.
- B.** Go right or down in the menu.
- D.** Confirm selection.



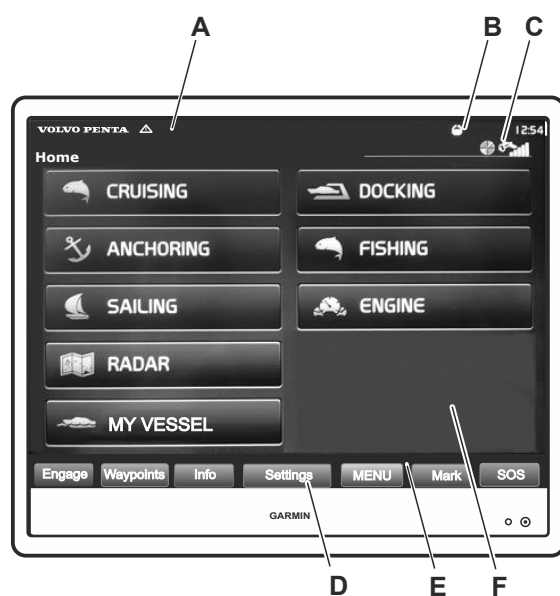
P0017684

Multifunction panel

- A.** Button function depends on the software installed.



P0017685



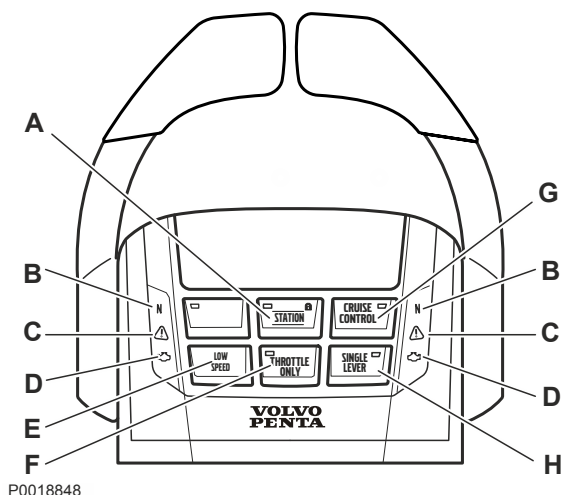
Volvo Penta Glass Cockpit

The Home menu is divided into fields:

- A. Warning and alarm symbols.
- B. Active function symbols.
- C. Shows current Autopilot settings.
- D. Settings with further selections.
- E. Optional screen functions.
- F. Main menus in home screen.

P0019900

Controls and Steering System



A. STATION Activated helm station.

Green LED indicator

- Constant light: Station activated.
- Extinguished: Station inactivated.
- Flashing: Warning or attempted unauthorized station transfer.

Red LED indicator

- Lit when system is locked. The engine can be controlled from the locked helm station.

B. Neutral LED Confirms neutral position.

Green LED indicator

- Constant light: Neutral.
- Extinguished: Ahead, Astern.
- Flashing: Calibration or warm-up mode.

C. Warning lamp

LED indication:

- Orange: Remark.
- Red: Warning.

D. MIL LED

Yellow indicator lamp.

E. LOW SPEED

Low speed function on/off.

F. THROTTLE ONLY

Gas only (disengaged drive) on/off.

G. CRUISE CONTROL

Cruise control on/off.

H. SINGLE LEVER

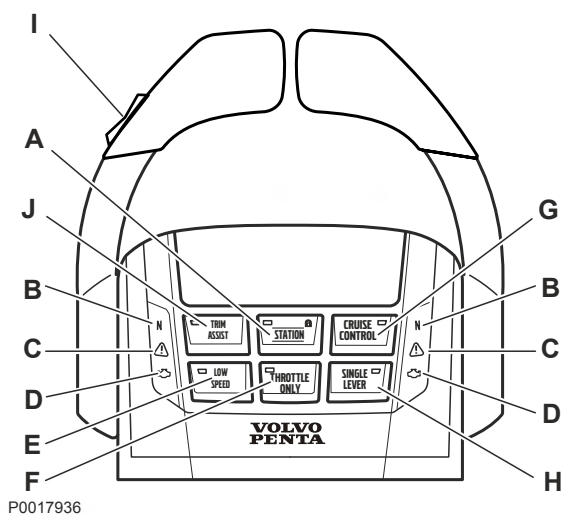
Yellow indicator lamp.

I. IS / POWER TRIM BUTTONS

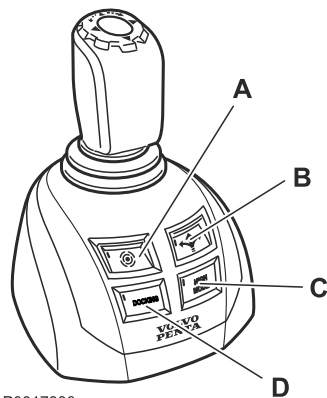
- Interceptor System (IS) manual: up/down
- Power Trim up/down.

J. IS / TRIM ASSIST

- Interceptor System (IS) auto/manual.
- Power Trim Assist (PTA) on/off.



With Interceptor System (IS)



P0017938

Joystick

A. DYNAMIC POSITIONING SYSTEM

Dynamic positioning system on/off.

B. JOYSTICK DRIVING

Joystick steering on/off.

C. HIGH MODE

Extra power on/off.

D. DOCKING

Docking function on/off.

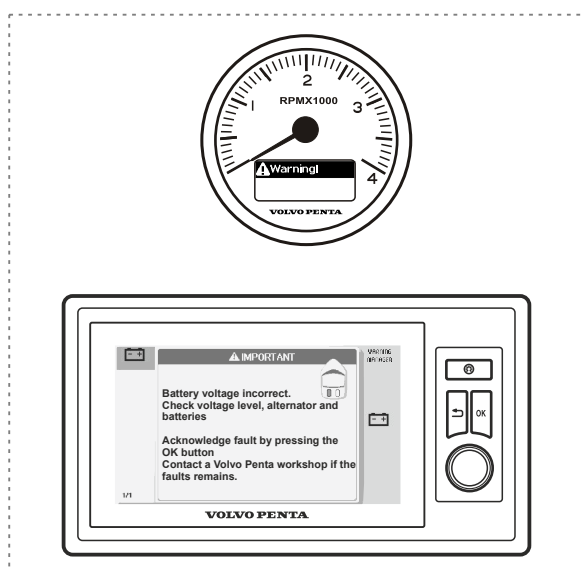
Alarm handling

Error message from the engine and EVC system.

The engine, transmission and the EVC system are monitored and checked by the diagnostics function. Should the diagnostic function discover a malfunction it will protect the engine and ensure continued operation by controlling the engine. The engine is controlled in different ways depending on the severity of the fault.

When a malfunction is detected, the helmsman is warned by an audible alarm and a message is displayed on the screen.

The message shows the cause of the fault and its remedy. This information is also available in the Fault Code Register in the engine's Operator's Manual.

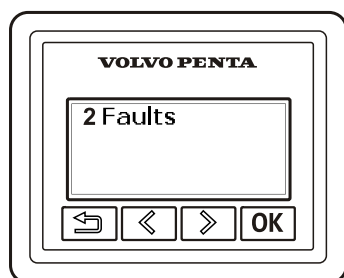


P0012489

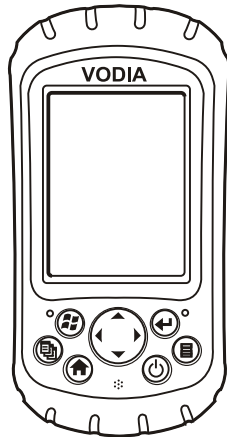
Acknowledge message

- 1 Push OK to acknowledge the alarm. The buzzer becomes silent.
- 2 Read the message.
- 3 Push OK again and the message disappears.

The alarm has to be acknowledged before the engine can be started.



P0012800



P0005180

IPS Calibration

The VODIA diagnostic tool may be used to adjust EVC system parameters. This is done with the **Parameter programming** tool in the **Service and maintenance** menu.

VODIA is a special tool from Volvo Penta, refer to Volvo Penta Partner Network to order.

Further information about VODIA use is available in the VODIA Operator's Manual that can be downloaded from Volvo Penta Partner Network.

Once contact with the system has been established, contact is then made with the specific ECU (Engine Control Unit) in the menu to show which unit parameters can be adjusted.

Adjustable parameters

NOTICE! Certain parameters may require special permission for adjustment.

Neutral signal

VODIA text: **"Neutral signal"**.

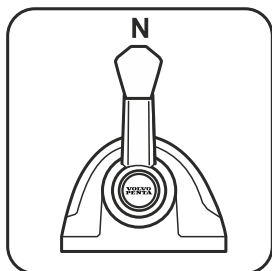
Activated for one PCU (MID 187).

The parameter enables activation or deactivation of the control lever neutral position function.

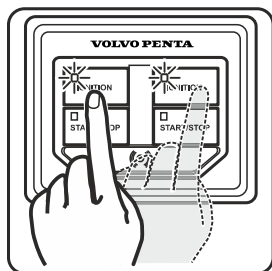
The function can be activated individually at helm station HCU's. If the function is required for all helm stations it must be activated in the PCU via VODIA. This affects all helm stations for the driveline concerned with up to four HCU's possible per driveline.

Calibrating Volvo Penta IPS drive units

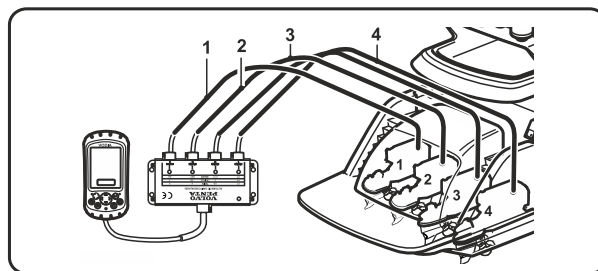
Performed by the OEM and consists of two parts: **Drive leg position**, which calibrates the relative positions between the drive and **Drive Alignment**, is carried out using a centering tool for the drives.



1. Control lever in neutral position.



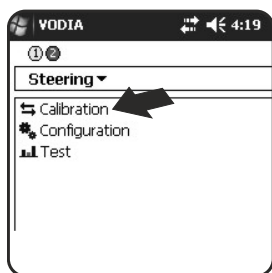
2. Turn on the ignition.



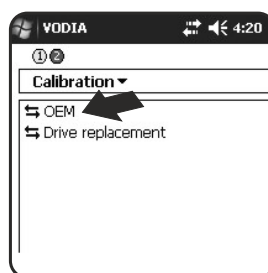
3. Connect to VODIA. (Example shows quad)



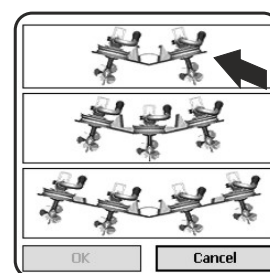
4. Select function group Steering.



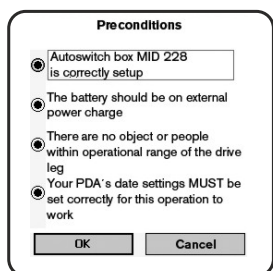
5. Select calibration.



6. Select OEM.



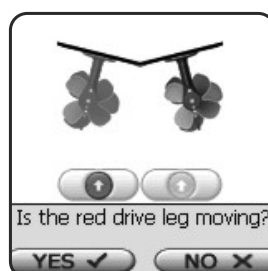
7. Select installation type.



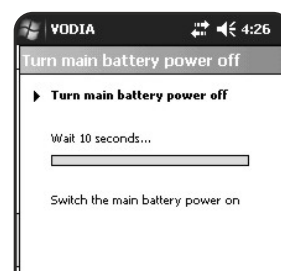
8. Preconditions.



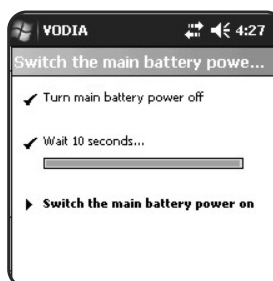
9. **Step 1:** Start Drive leg position and follow the instructions.



10. For example: Is the marked drive leg moving?



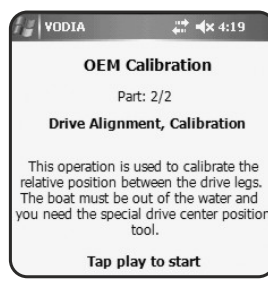
11. Cut the current with the main switches. Wait 10 seconds.



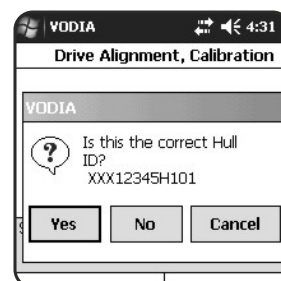
12. Turn the main switch on.



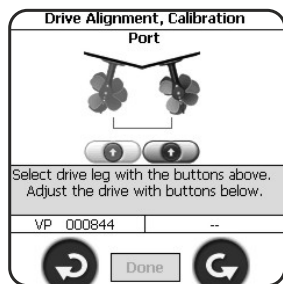
13. Confirm with OK.



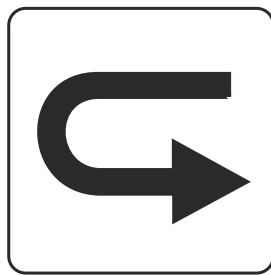
14. **Step 2:** Start Drive alignment and follow the instructions.



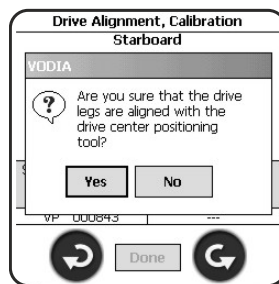
15. Confirm the hull ID.



16. Select driveline. Adjust the drive with arrow buttons and press Done.



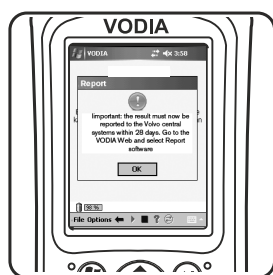
17. Repeat for additional engines.



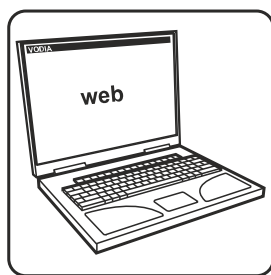
18. Are you sure that the drive legs are aligned with the center positioning tool?



19. Caution! Remove the positioning tool.



20. Report the result within 28 days.

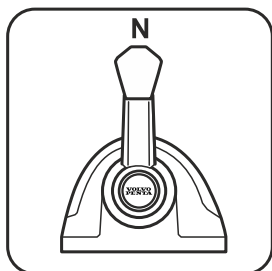


21. VODIA web, select Report software.

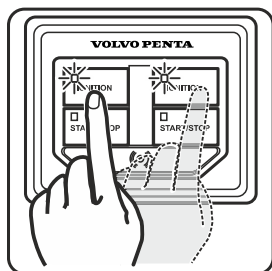
Steering mode

Steering mode specifies the relative positions between the drives. Select between steering rates Minimum, Medium and Maximum. Additionally, IPS2 and IPS3 have two medium positions: low and high. Maximum steering rate provides the smallest turning radius.

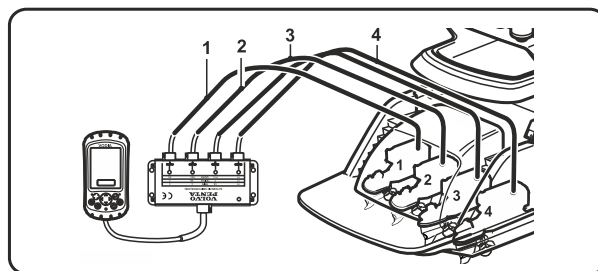
NOTICE! Where necessary, determine steering mode settings according to the Sea Trial Wizard.



1. Move control to neutral.



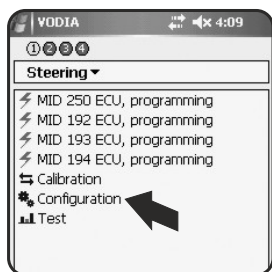
2. Turn the ignition on.



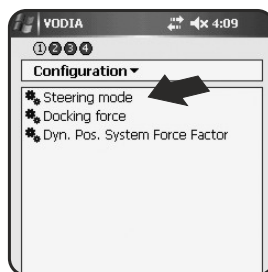
3. Connect to VODIA. (Example shows quad)



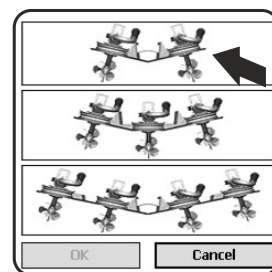
4. Select function group Steering.



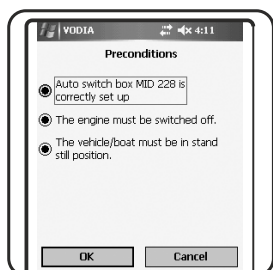
5. Configuration.



6. Steering mode.



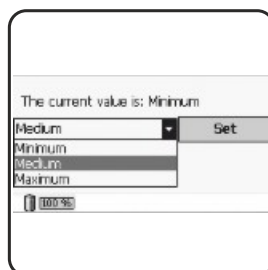
7. Select installation type.



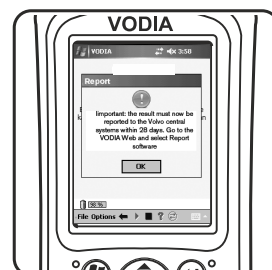
8. Preconditions



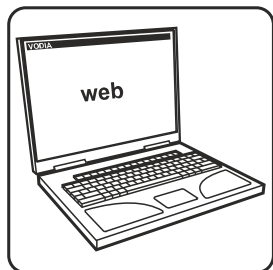
9. Tap Play to start.



10. Select steering mode.



11. Report the result within 28 days.

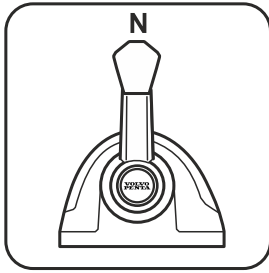


12. VODIA web, select Report software.

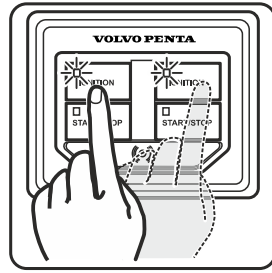
Auto configuration, twin installation

In example below the 2.5" display is used. If 4" or 7" display, use keys / knobs to navigate and OK to confirm.

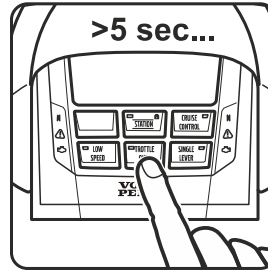
* Indication not shown / skip the item during new installation.



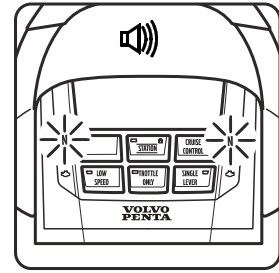
1. Put the gear in neutral



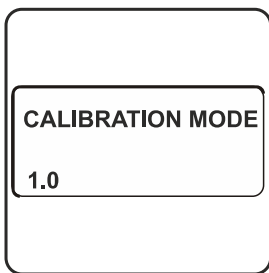
2.* Turn the ignition on.



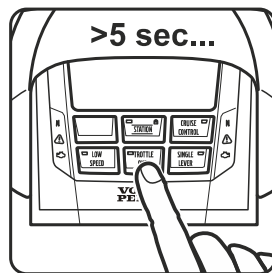
3. Press THROTTLE ONLY



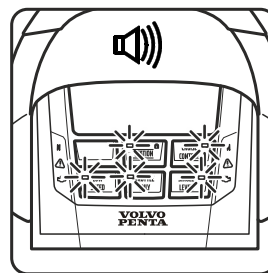
4.* Indicates that calibration mode is activated.



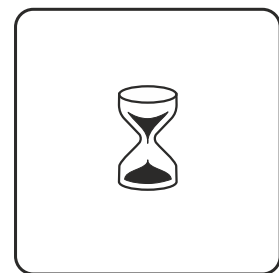
5.* Calibration Mode 1.0



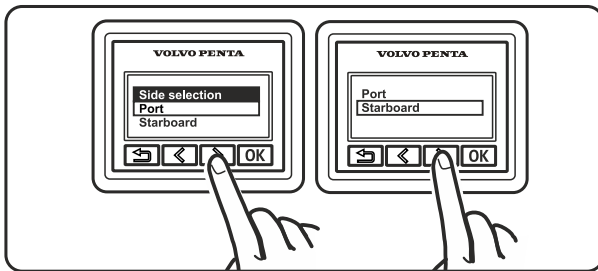
6. Press THROTTLE ONLY



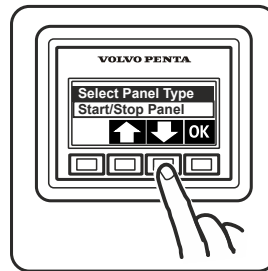
7.* Auto configuration begun.



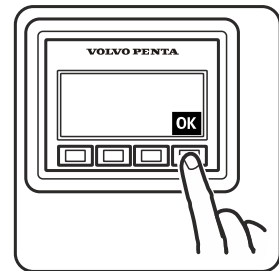
8. Wait.



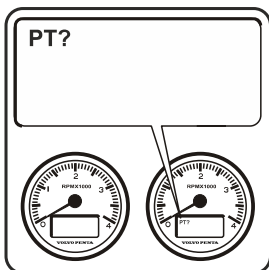
9. Select the engine to be shown in each display. Confirm with OK.



10. If multifunction panel: select type of panel.



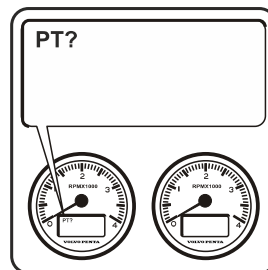
11. Confirm with OK.



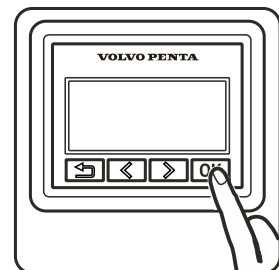
12. Configure any tachometer.



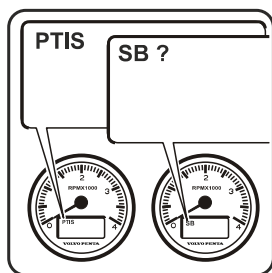
13. Allocate tachometer. Scroll using the arrow buttons.



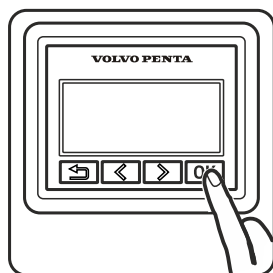
14. Allocate port tachometer.



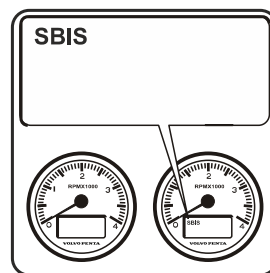
15. Confirm with OK.



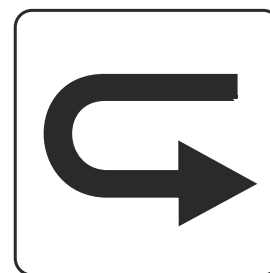
16. Port ready, allocate starboard.



17. Confirm with OK.



18. Starboard confirmed.



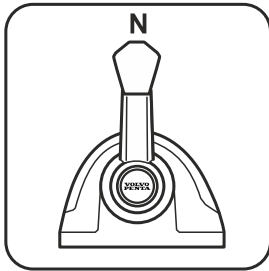
19. Repeat steps 9–18 for further helm stations.

20. Restart the system to confirm the calibration.

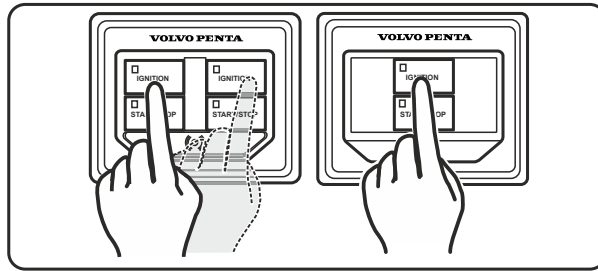
Auto configuration, triple installation

In example below the 2.5" display is used. If 7" display, use keys / knobs to navigate and OK to confirm.

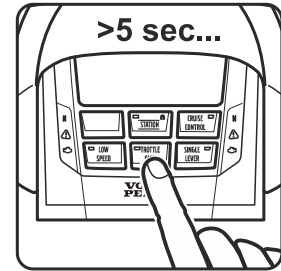
NOTICE! * Indication not shown / skip the item during new installation.



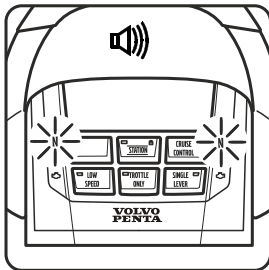
1. Move control to neutral.



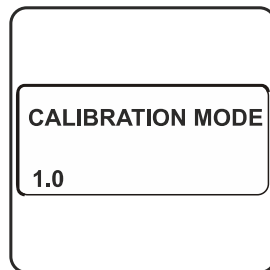
2.* Turn the ignition on.



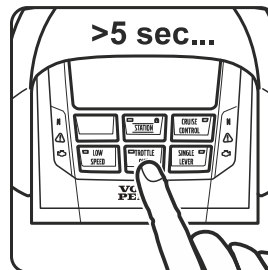
3. Press THROTTLE ONLY



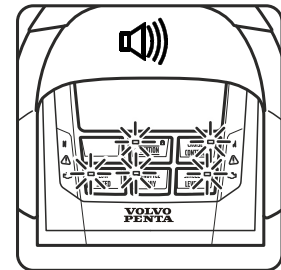
4.* Indicates that calibration mode is activated.



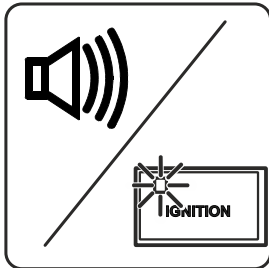
5.* Calibration Mode 1.0 in the display.



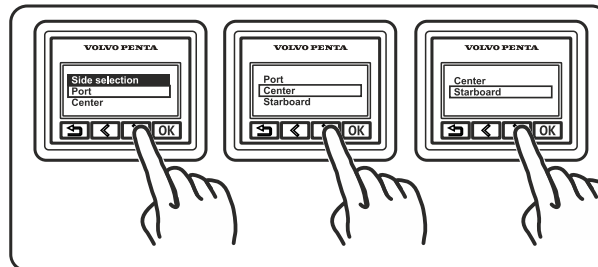
6. Press THROTTLE ONLY



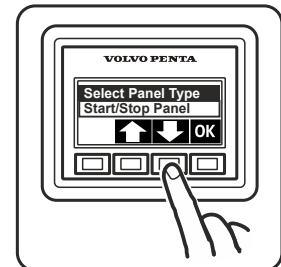
7.* Auto configuration begun.



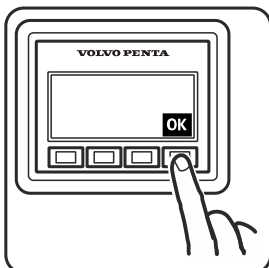
8. Wait until buzzer and ignition light activates.



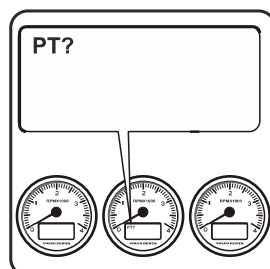
9. Select the engine to be shown in each display. Confirm with OK.



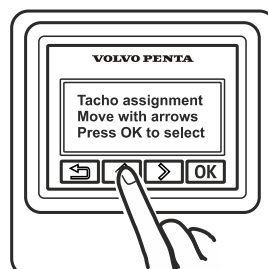
10. If multifunction panel: select type of panel.



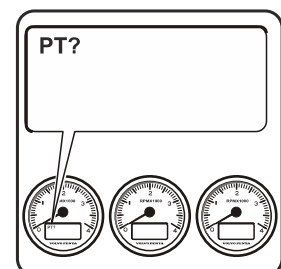
11. Confirm with OK.



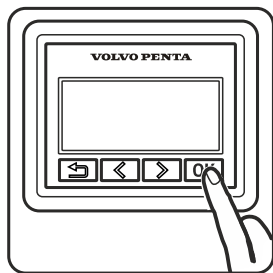
12. Configure any tachometer.



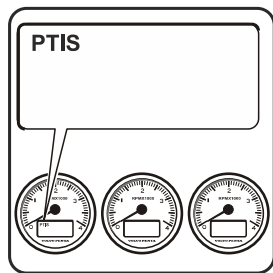
13. Allocate tachometer. Scroll using the arrow buttons.



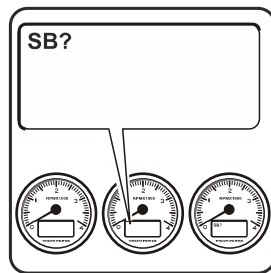
14. Allocate port tachometer.



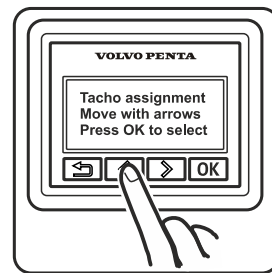
15. Confirm with OK.



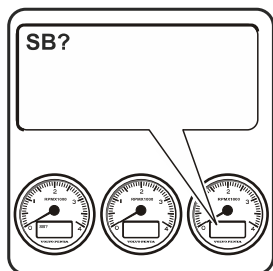
16. Port ready, allocate starboard.



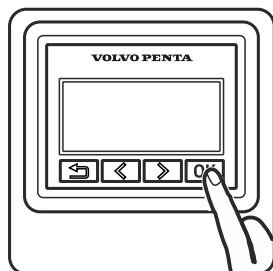
17. Starboard Engine?



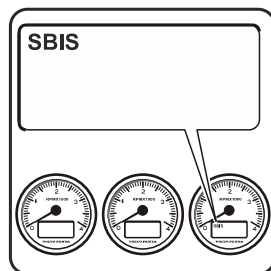
18. Allocate tachometer. Scroll using the arrow buttons.



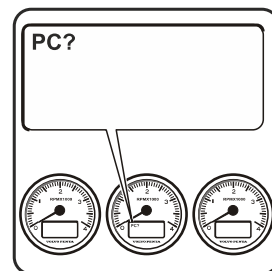
19. Starboard Engine?



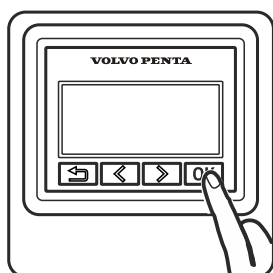
20. Confirm with OK.



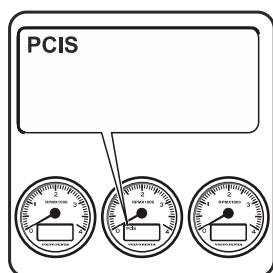
21. Starboard confirmed.



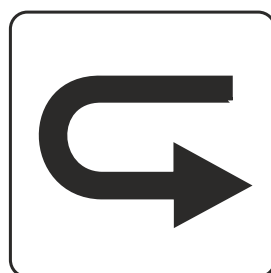
22. Center engine?



23. Confirm with OK.



24. Center confirmed.



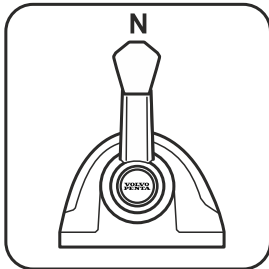
25. Repeat steps 9–24 for further helm stations.

26. Restart the system to confirm the calibration.

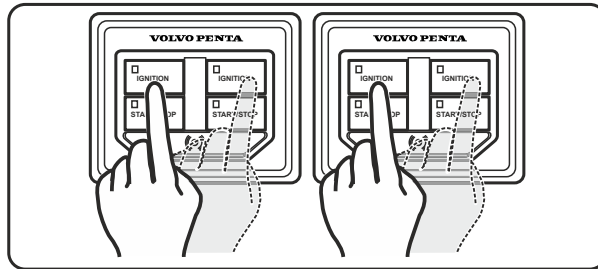
Auto configuration, quadruple installation

In example below the 2.5" display is used. If 7" display, use keys / knobs to navigate and OK to confirm.

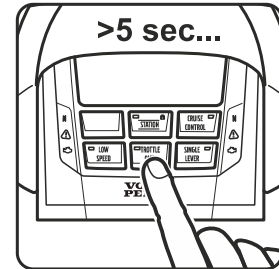
NOTICE! * Indication not shown / skip the item during new installation.



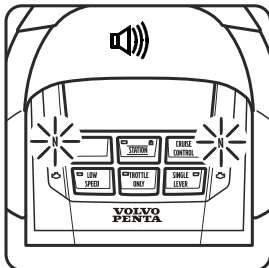
1. Move control to neutral.



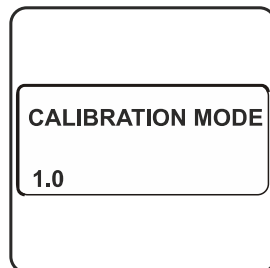
2.* Turn the ignition on.



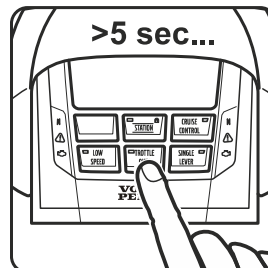
3. Press THROTTLE ONLY



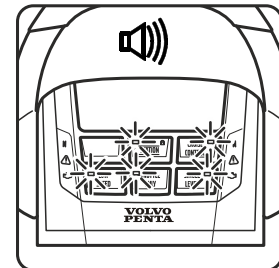
4.* Indicates that calibration mode is activated.



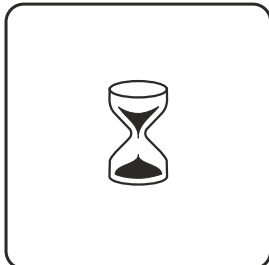
5.* Calibration Mode 1.0



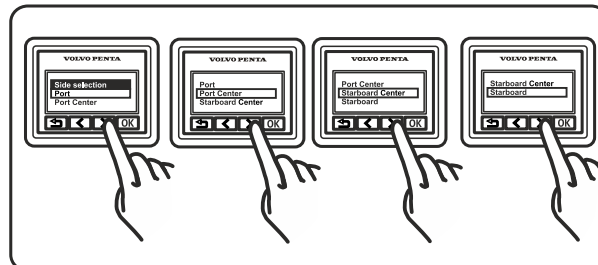
6. Press THROTTLE ONLY



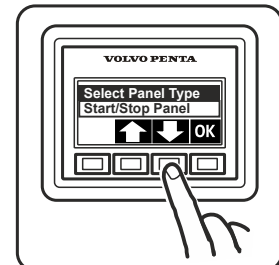
7.* Auto configuration begun.



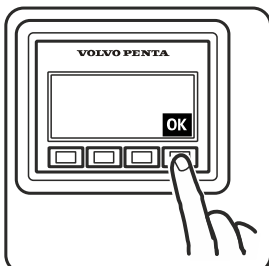
8. Wait.



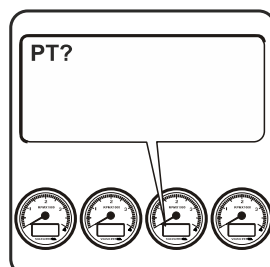
9. Select the engine to be shown in each display. Confirm with OK.



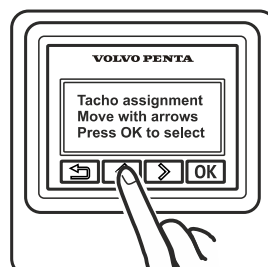
10. If multifunction panel: select type of panel.



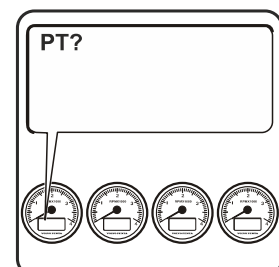
11. Confirm with OK.



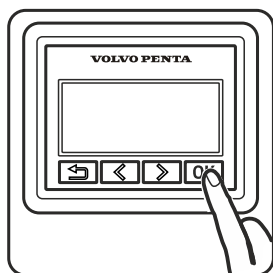
12. Configure any tachometer.



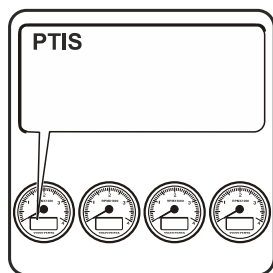
13. Allocate tachometer. Scroll using the arrow buttons.



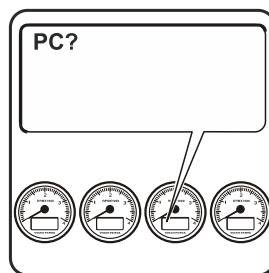
14. Port Engine?



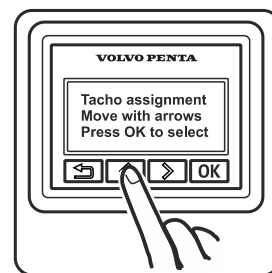
15. Confirm with OK.



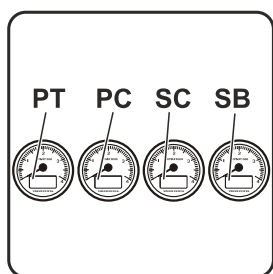
16. Allocate port tachometer.



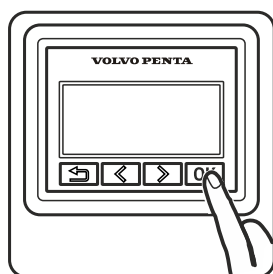
17. Port center engine?



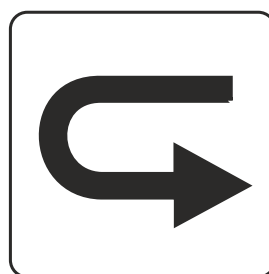
18. Allocate tachometer. Scroll using the arrow buttons.



19. Repeat for all tachometers.



20. Confirm with OK.



21. Repeat steps 9–20 for further helm stations.

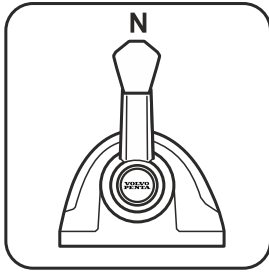


22. Restart the system to confirm the calibration.

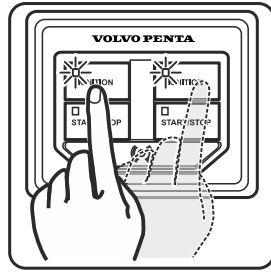
Auto configuration, 4" display

NOTICE! 4" display can not be used in combination with 2,5" or 7" display at the same helm station.

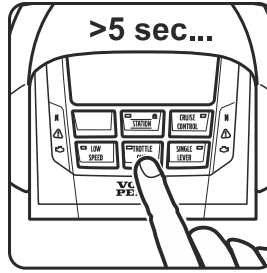
NOTICE! * Indication not shown / skip the item during new installation. (Example below show a twin installation)



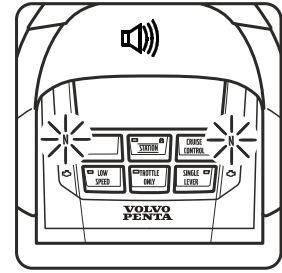
1. Move control to neutral.



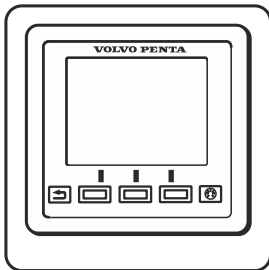
2.* Turn the ignition on.



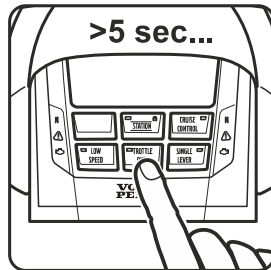
3. Press THROTTLE ONLY



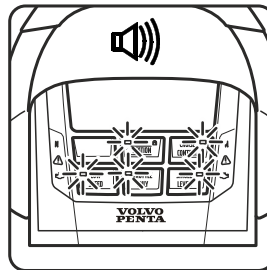
4.* Indicates that calibration mode is activated.



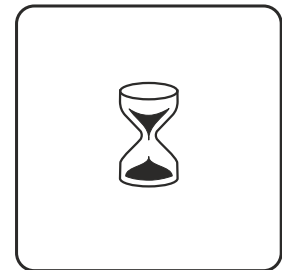
5.* Calibration Mode 1.0



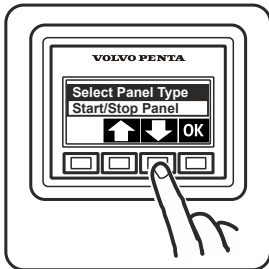
6. Press THROTTLE ONLY



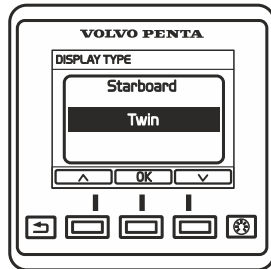
7.* Auto configuration begun.



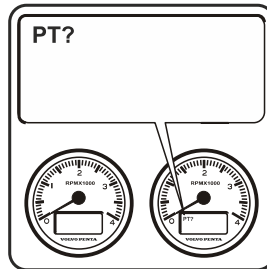
8. Wait.



9. If multifunction panel: select type of panel. Confirm with OK.



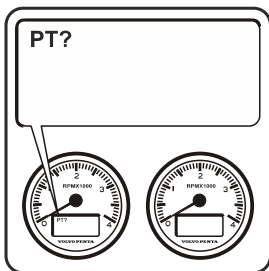
10. Select display type. Confirm with OK.



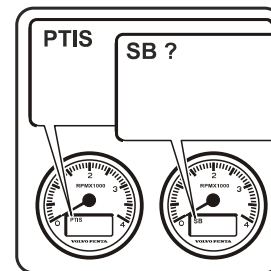
11. Configure any tachometer.



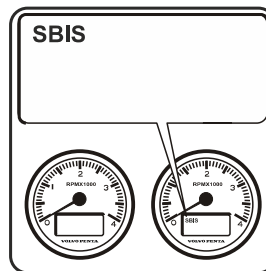
12. Allocate tachometer. Scroll using the arrow buttons.



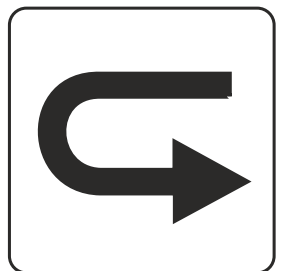
13. Allocate port tachometer. Confirm with OK.



14. Port ready, allocate starboard. Confirm with OK.



15. Starboard confirmed.



16. Repeat steps 9–15 for further helm stations.

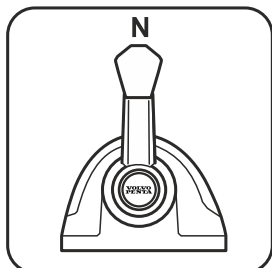
17. Restart the system to confirm the calibration.

Auto configuration, 7" display

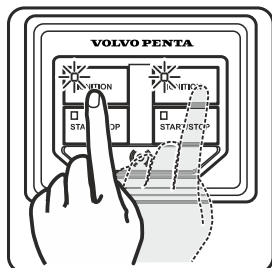
NOTICE! If two 7" displays are used on one helm station they must be configured as TWIN/TWIN SECONDARY respective port/starboard (on twin installations) as TRIPLE/TRIPLE SECONDARY (on triple installations) and as QUAD PORT/QUAD STARBOARD (on quad installations)

NOTICE! * Indication not shown / skip the item during new installation.

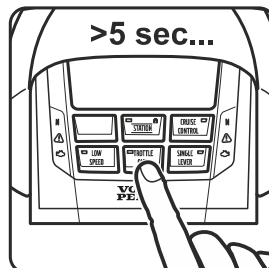
(Example below show a twin installation)



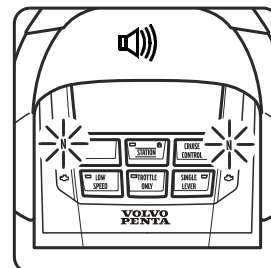
1. Move control to neutral.



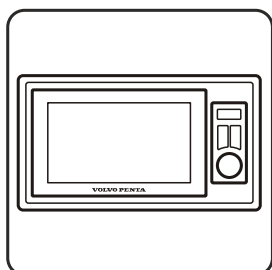
2.* Turn the ignition on.



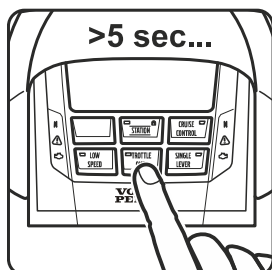
3. Press THROTTLE ONLY



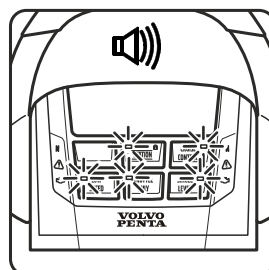
4.* Indicates that calibration mode is activated.



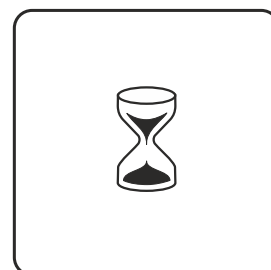
5.* Calibration Mode 1.0



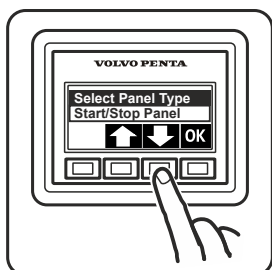
6. Press THROTTLE ONLY



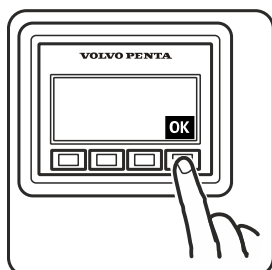
7.* Auto configuration begun.



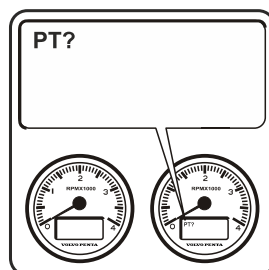
8. Wait.



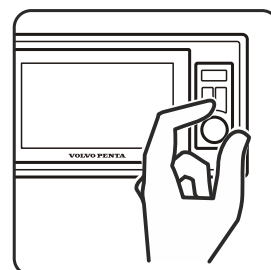
9. If multifunction panel: select type of panel.



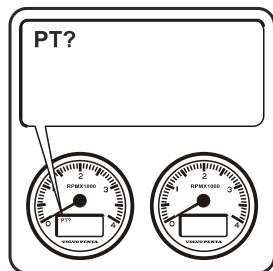
10. Confirm with OK.



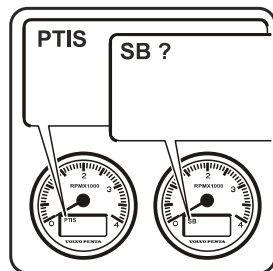
11. Configure any tachometer.



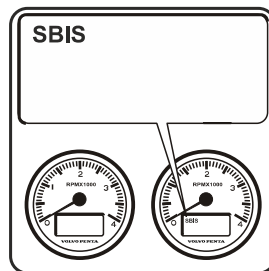
12. Allocate tachometer. Scroll using the arrow buttons.



13. Allocate port tachometer.
Confirm with OK.



14. Port ready, allocate starboard.
Confirm with OK.



15. Starboard confirmed.



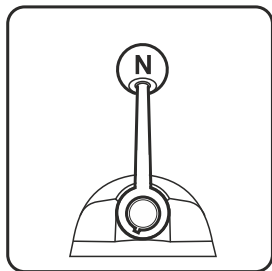
16. Repeat steps 9–15 for further helm stations.

17. Restart the system to confirm the calibration.

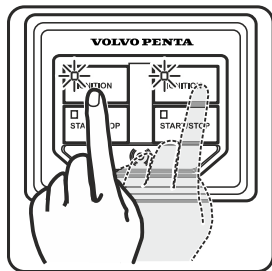
Auto configuration, analog lever

In example below the 2.5" display is used. If 7" display, use keys / knobs to navigate and OK to confirm.

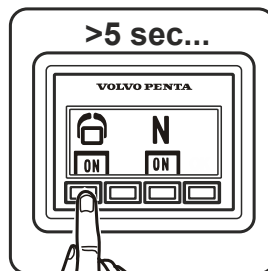
NOTICE! * Indication not shown / skip the item during new installation. (Example below show a twin installation)



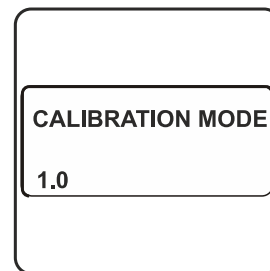
1. Move control to neutral.



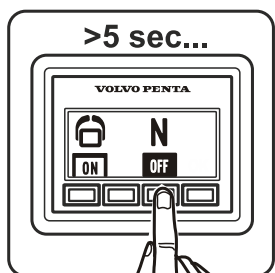
2.* Turn the ignition on.



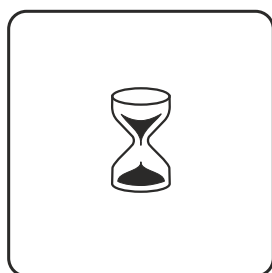
3. Set active station.



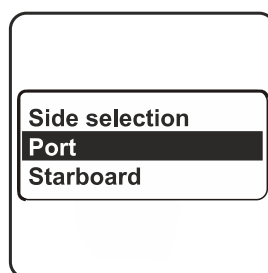
4.* Calibration Mode 1.0



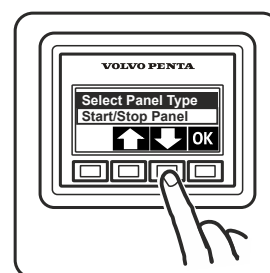
5. Push the Neutral button.



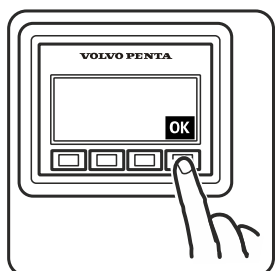
6. Wait.



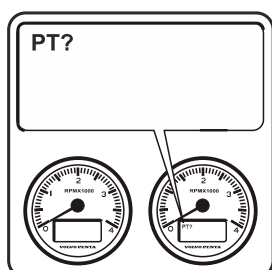
7. Select Port engine. Confirm with OK.



8. If multifunction panel: select type of panel.⁽¹⁾



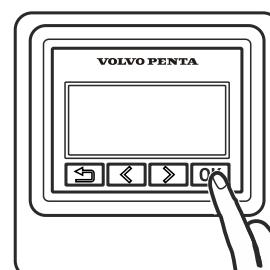
9. Confirm with OK.



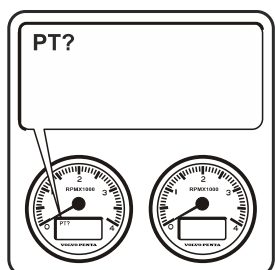
10. Configure any tachometer.



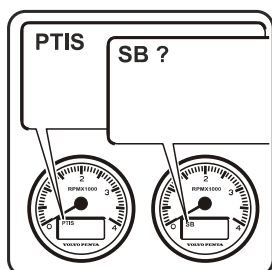
11. Allocate tachometer. Scroll using the arrow buttons.



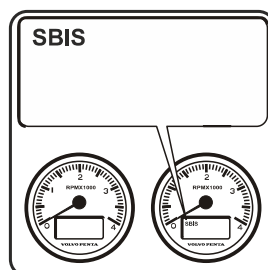
12. Confirm with OK.



13. Allocate port tachometer. OK



14. Port ready, allocate starboard. OK



15. Starboard confirmed.



16. Repeat steps 7–15 for further helm stations.

17. Restart the system to confirm the calibration.

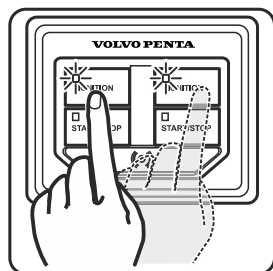
1. Start/Stop panel required at each station.

Language

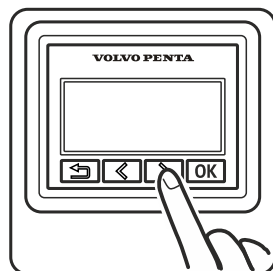
Select preferred language:

English, Danish, Finnish, French, Dutch, Italian, Portuguese, Spanish, Swedish and German.

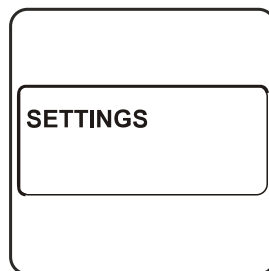
NOTICE! The setting need only be made at one helm station to be displayed on all screens at all helm stations.



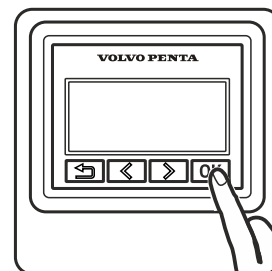
1. Turn the ignition on.



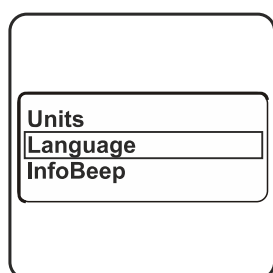
2. Scroll the menu.



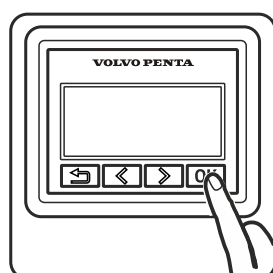
3. Settings



4. Confirm with OK.



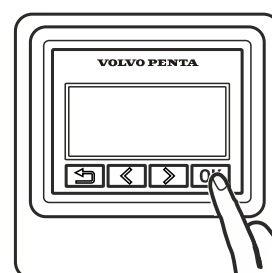
5. Scroll to Language menu.



6. Confirm with OK.



7. Select preferred language.



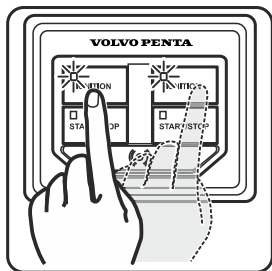
8. Confirm with OK.



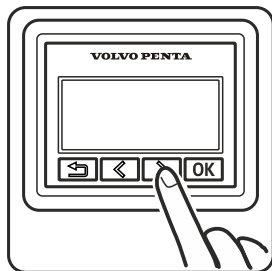
9. Restart the system to confirm the calibration.

Units

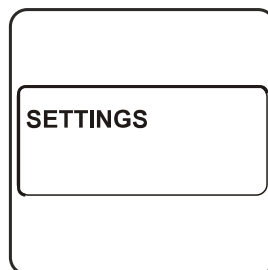
NOTICE! The setting need only be made at one helm station to be displayed on all screens at all helm stations.



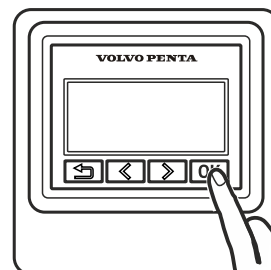
1. Turn the ignition on.



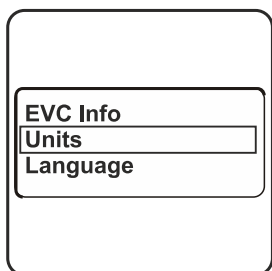
2. Scroll the menu.



3. Settings



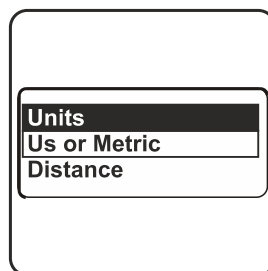
4. Confirm with OK.



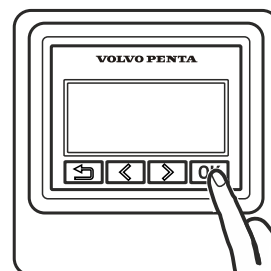
5. Scroll to the Units menu.



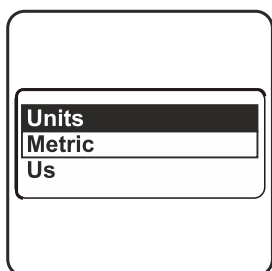
6. Confirm with OK.



7. Select preferred units.



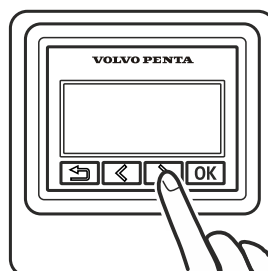
8. Confirm with OK.



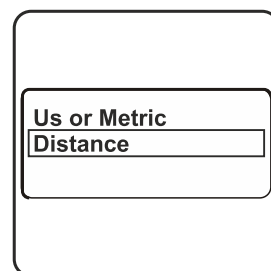
9. Select preferred units.



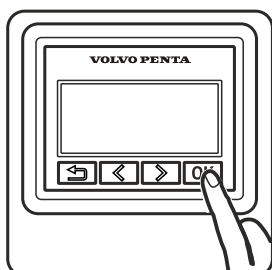
10. Confirm with OK.



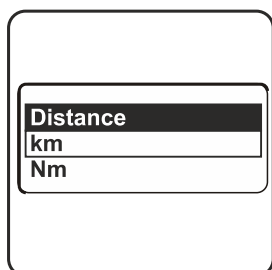
11. Scroll to set units of distance.



12. Scroll to Distance.



13. Confirm with OK.



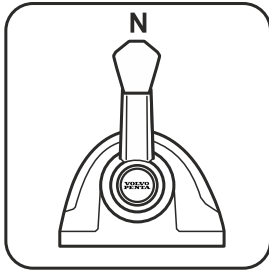
14. Select unit and confirm with OK.



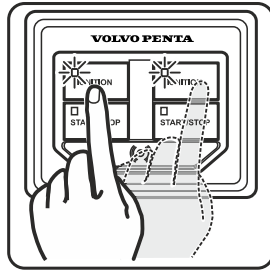
15. Restart the system to confirm the calibration.

Add e-Key

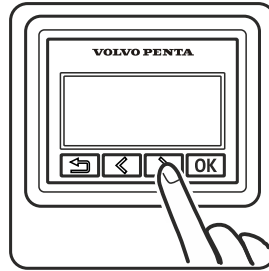
NOTICE! The ignition must be on and engine(s) stopped.



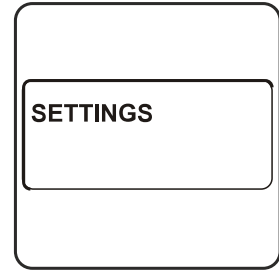
1. Move control to neutral.



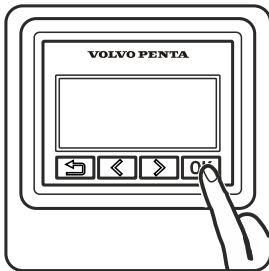
2. Turn the ignition on.



3. Scroll the menu.



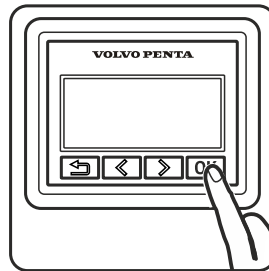
4. Settings.



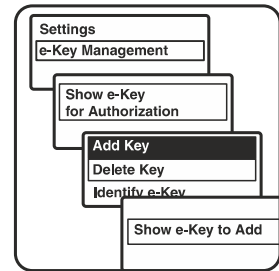
5. Confirm with OK.



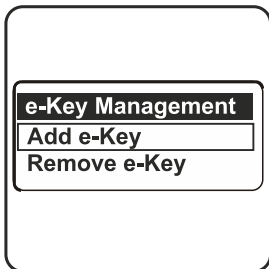
6. Scroll to the e-Key management menu.



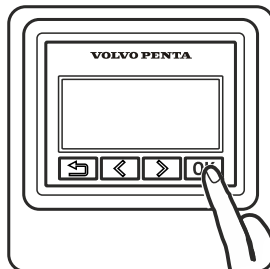
7. Confirm with OK.



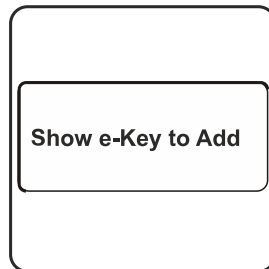
8. If previous e-Key exists, confirm it before step 9.



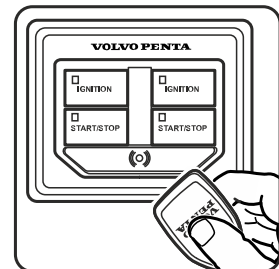
9. Select Add e-Key.



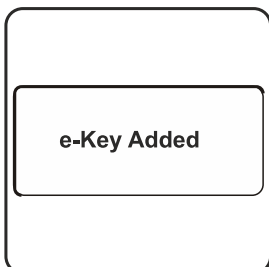
10. Confirm with OK.



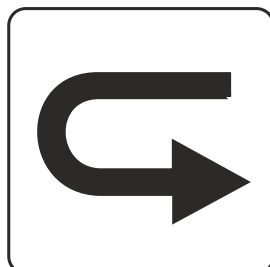
11. Show e-Key to add.



12. Hold the new e-Key in front of the Start/Stop panel.



13. e-Key added.
Remaining available locations for e-Key in display.



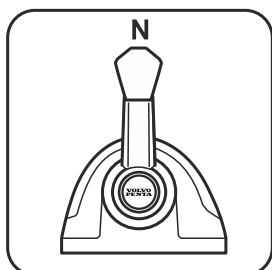
14. Repeat steps 9–13 for additional e-Keys.



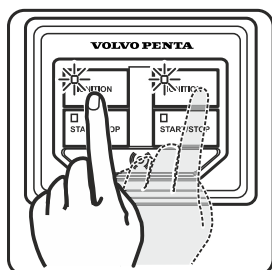
15. Restart the system to confirm the calibration.

Lever Calibration, top mounted lever

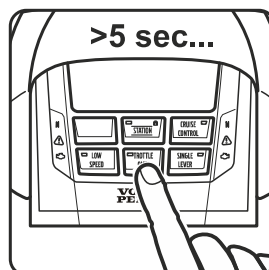
NOTICE! Both levers must be calibrated at the same time to provide the same positions for all engines.
WOT = Wide Open Throttle.



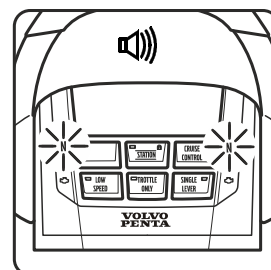
1. Move control to neutral.



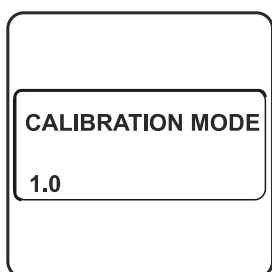
2. Turn the ignition on.



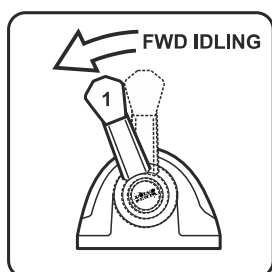
3. Press THROTTLE ONLY



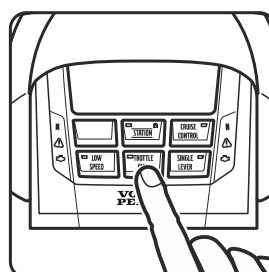
4. Indicates that calibration mode is activated.



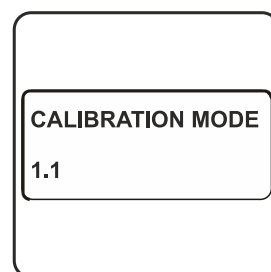
5. Calibration Mode 1.0.



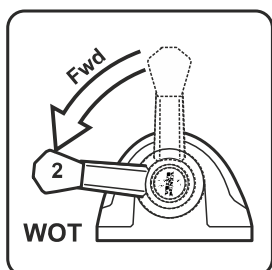
6. Move the levers ahead to position 1.



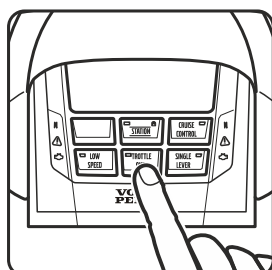
7. Press THROTTLE ONLY



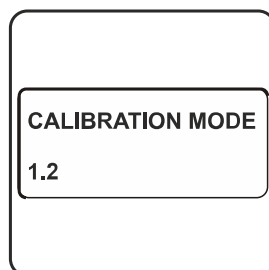
8. Calibration Mode 1.1.



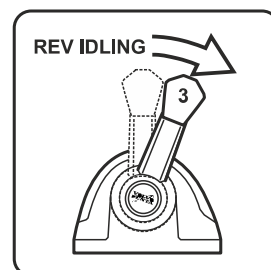
9. Full power ahead.



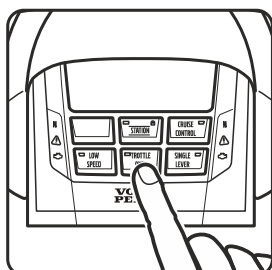
10. Press THROTTLE ONLY



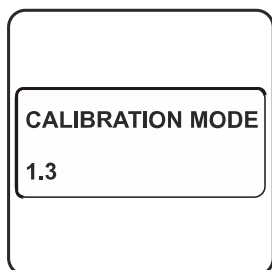
11. Calibration Mode 1.2.



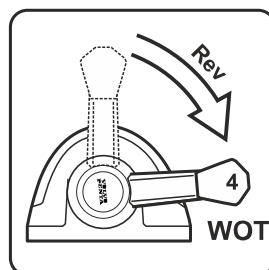
12. Move the levers astern to position 3.



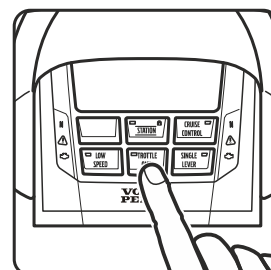
13. Press THROTTLE ONLY



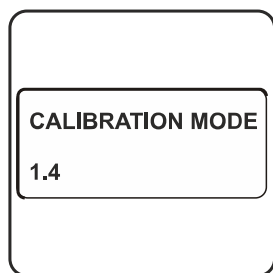
14. Calibration Mode 1.3.



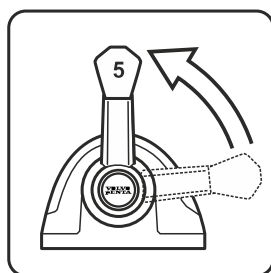
15. Full power astern.



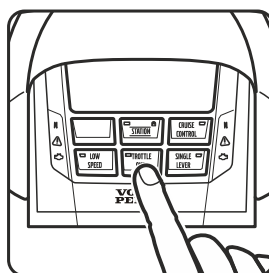
16. Press THROTTLE ONLY



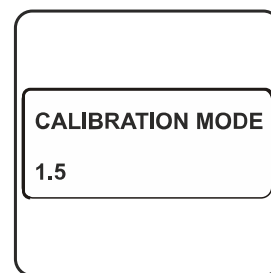
17. Calibration Mode 1.4.



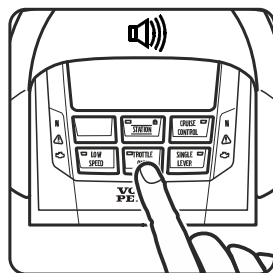
18. Move control to neutral.



19. Press THROTTLE ONLY



20. Calibration Mode 1.5.



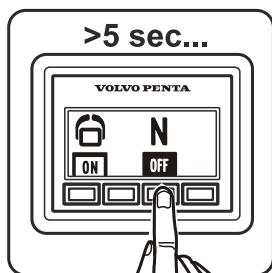
21. Press THROTTLE ONLY An audible signal will confirm that calibration is complete.



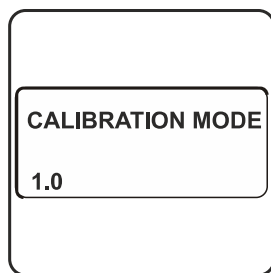
22. Restart the system to confirm the calibration.

Lever calibration, analog lever with stand-alone HCU

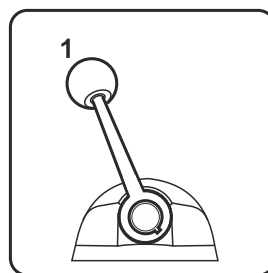
WOT = Wide Open Throttle.



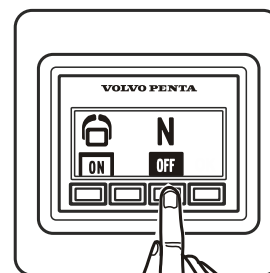
1. Push the Neutral button.



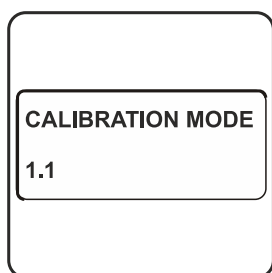
2. Calibration Mode 1.0.



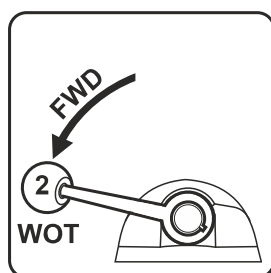
3. Move the levers ahead to position 1.



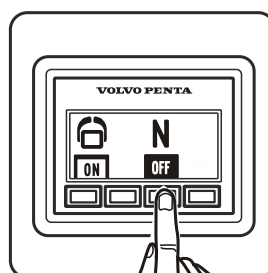
4. Confirm the position.



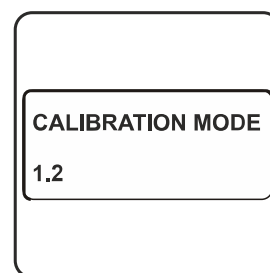
5. Calibration Mode 1.1.



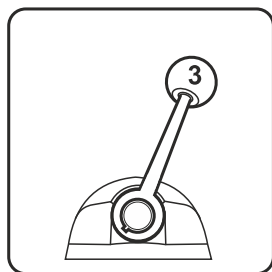
6. Move the lever to position 2.



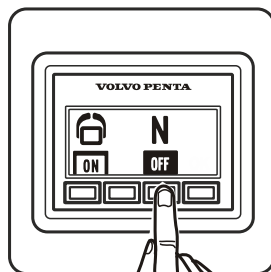
7. Confirm the position.



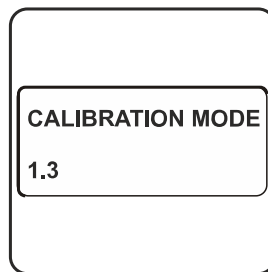
8. Calibration Mode 1.2.



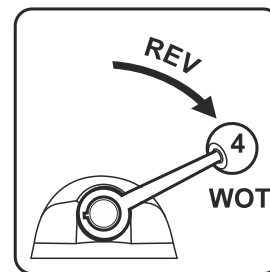
9. Move the levers astern to position 3.



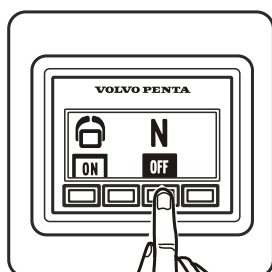
10. Confirm the position.



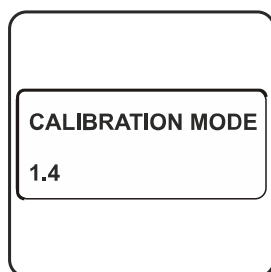
11. Calibration Mode 1.3.



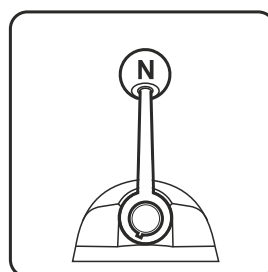
12. Move the lever to position 4, WOT astern.



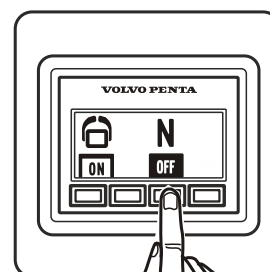
13. Confirm the position.



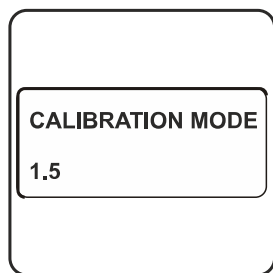
14. Calibration Mode 1.4.



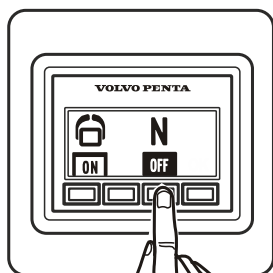
15. Put the gear in neutral



16. Confirm the position.



17. Calibration Mode 1.5.



18. To finish, press Neutral.



19. Restart the system to confirm the calibration.

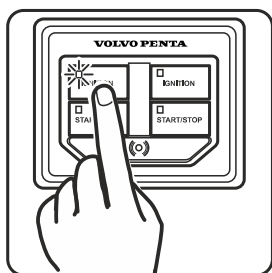
Fuel tank settings

- If only one tank is fitted it must be configured as port side. If there are two tanks they must be calibrated separately; begin by configuring the port side tank.
- There are two alternative ways of calibrating the fuel tank level sensor. **Full tank calibration** is an approximate method while **Multi-point calibration** provides more precise results. Multi-point calibration is a prerequisite for the trip computer to show fully accurate information.
- Auto-configuration must be done when the fuel tank sensor is connected.

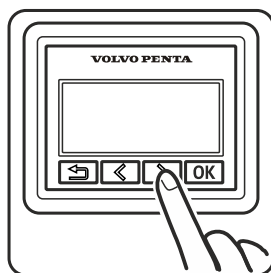
Setting alarm level and tank volume

NOTICE! The tank must be empty.

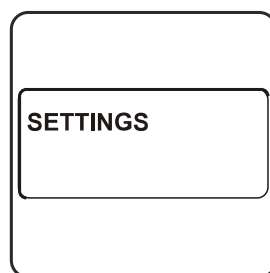
NOTICE! The alarm is switched off at the factory = 0%.



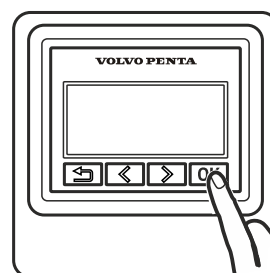
1. Switch on ignition to the port engine.



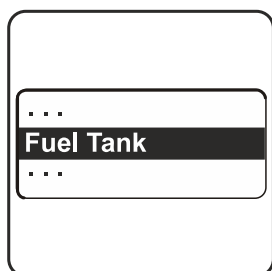
2. System with 2.5" Display.



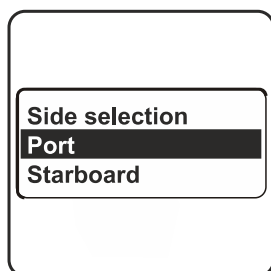
3. Settings.



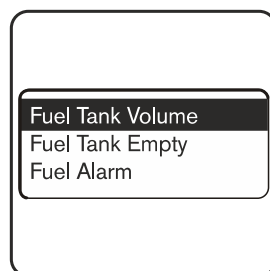
4. Confirm with OK.



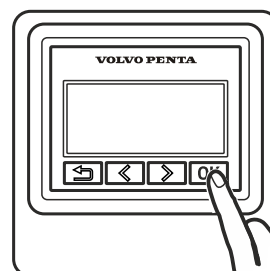
5. Scroll to Fuel Tank. Confirm with OK.



6. Select port side.



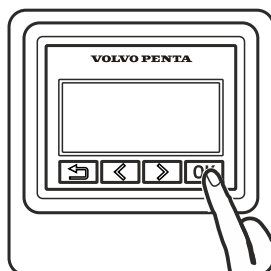
7. Scroll to Fuel Tank Volume.



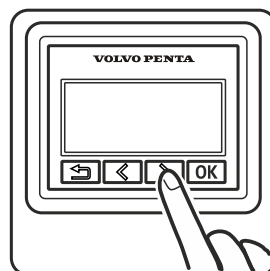
8. Confirm with OK.



9. Warning! May only be performed by qualified Volvo Penta personnel.



10. Confirm the warning message.



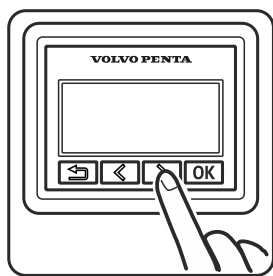
11. Set the max volume.



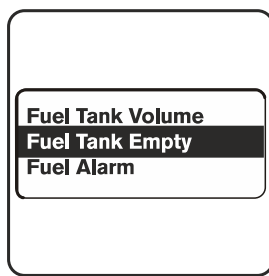
12. Scroll to correct value.



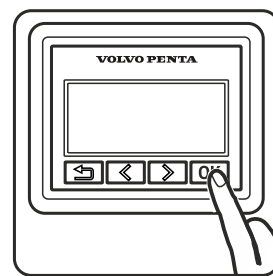
13. Confirm with OK.



14. System with 2.5" Display.



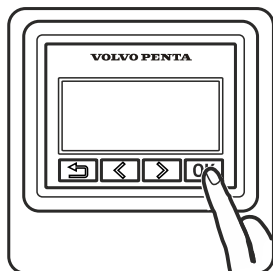
15. Select Fuel Tank Empty



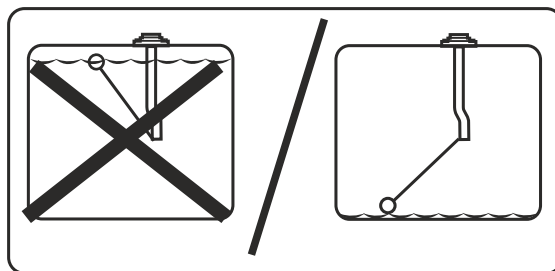
16. Confirm with OK.



17. Warning! May only be performed by qualified Volvo Penta personnel.



18. Confirm the warning message.



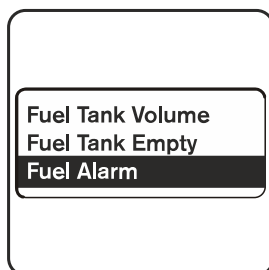
19. Make sure the tank is empty and the sensor is correctly positioned.



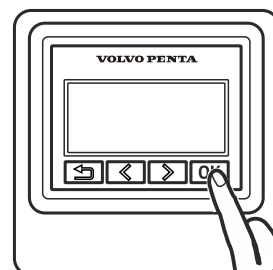
20. FUEL TANK PUSH WHEN EMPTY.



21. Confirm that the tank is empty.



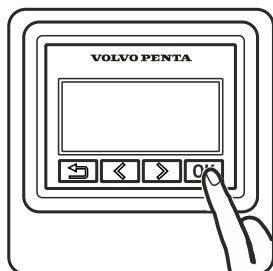
22. Scroll to Fuel Alarm.



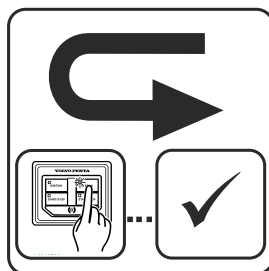
23. Confirm with OK.



24. Set preferred alarm level.



25. Confirm with OK.



26. Turn ignition off.

Repeat for further fuel tanks with port ignition off.

27. Restart the system to confirm the calibration.

Multi-point calibration

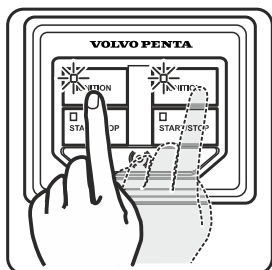
To carry out multi-point calibration, fill the fuel tank to max 20% of its total capacity.

NOTICE! Empty tank calibration must be concluded before multi-point calibration is performed.

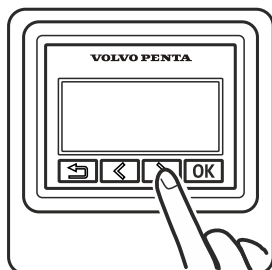
Calibration is carried out in five steps:

- Position 1: 20% full tank.
- Position 2: 40% full tank.
- Position 3: 60% full tank.

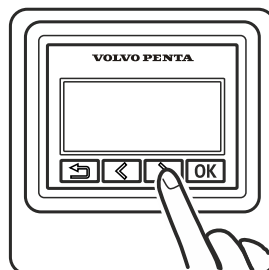
- Position 4: 80% full tank.
- Position 5: 100% full tank.



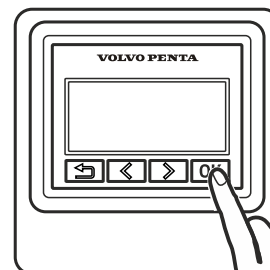
1. Turn the ignition on.



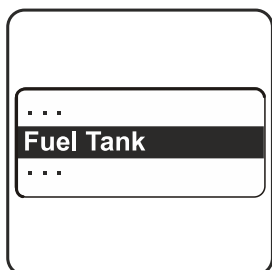
2. System with 2.5" Display.



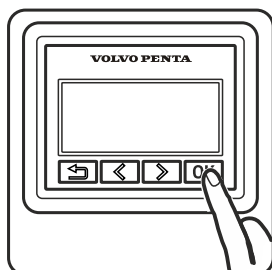
3. Settings



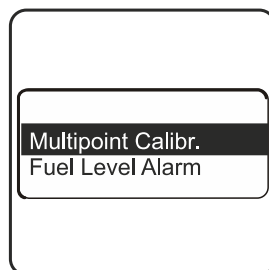
4. Confirm with OK.



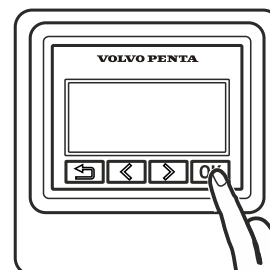
5. Scroll to the Fuel Tank menu.



6. Confirm with OK.



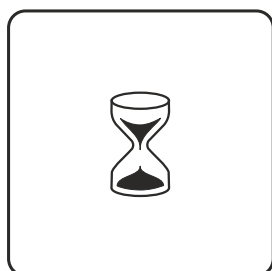
7. Scroll to Multi-Point Calibration



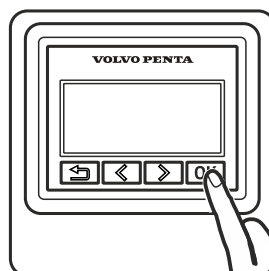
8. Confirm with OK.



9. Fill the tank with the quantity specified for Pos. 1



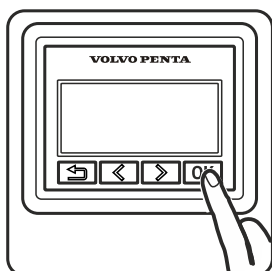
10. Wait for 10 seconds.



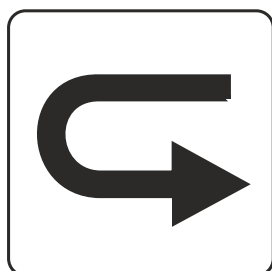
11. Confirm when tank is filled to the specified level.



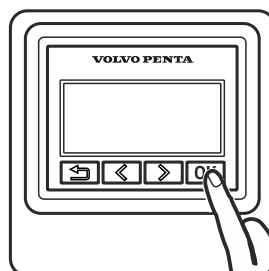
12. Fill to the volume specified for Pos. 2. Wait 10 seconds.



13. Confirm when tank is filled to the specified level.



14. Repeat the procedure for Pos. 3, Pos. 4 and Pos 5.



15. Confirm each position.



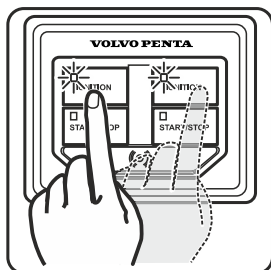
17. Restart the system to confirm the calibration.

Water in oil sensor

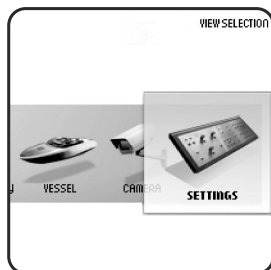
System with 7" Display

Applies to **IPS 800–950** and **IPS 1050–1200**. Perform for new installations and oil change.

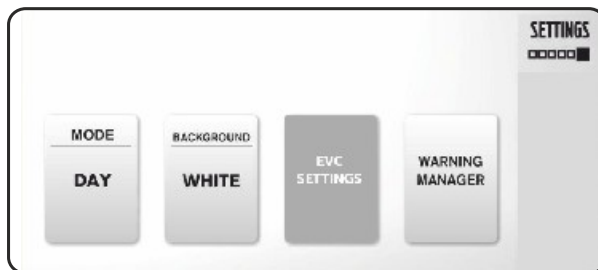
NOTICE! Preconditions: Engine running below 1000 RPM.



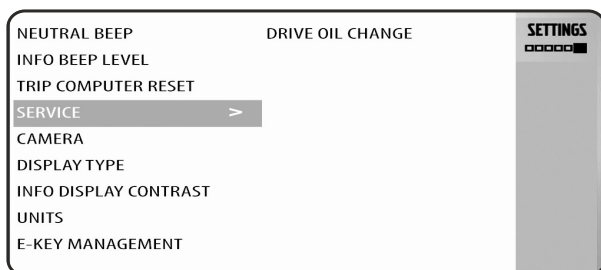
1. Ignition must be on for all drivelines.



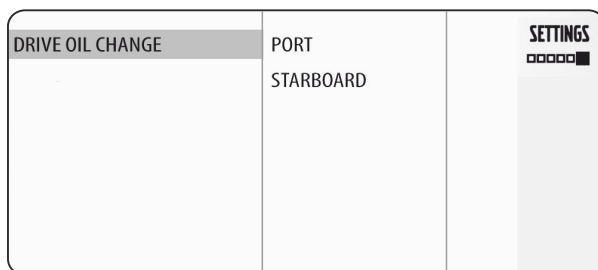
2. Go to Settings



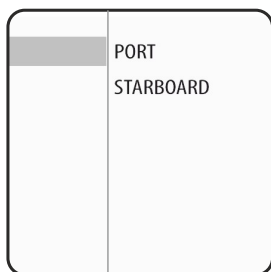
3. EVC Settings.



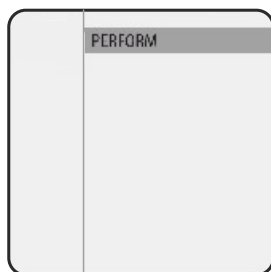
4. Select Service.



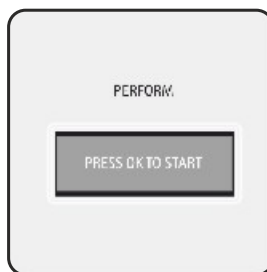
5. Select Drive oil change.



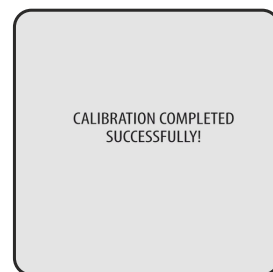
6. Select driveline.



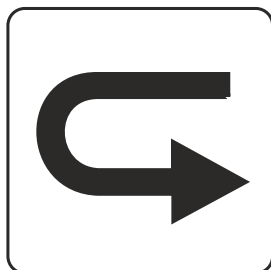
7. Select Perform.



8. Press OK to start.



9. Calibration completed successfully.



10. Repeat for additional engines.



11. Restart the system to confirm the calibration.

Slip calibration

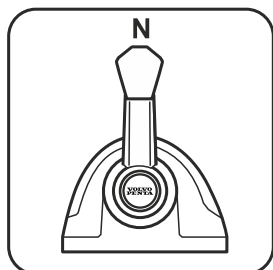
CAUTION!

This procedure requires the engine to be running. The gear will be engaged, be prepared for sudden movements.

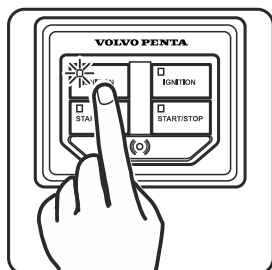
Carry out trolling calibration for one engine at a time to avoid excessive forces. Use both levers to calibrate trippel installation.

NOTICE! Do not perform calibration before transmission temperature has reached at least 30°C (86°F).

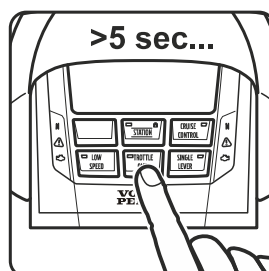
NOTICE! To be performed in open water.



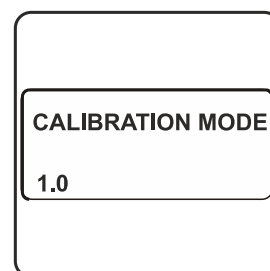
1. Move control to neutral.



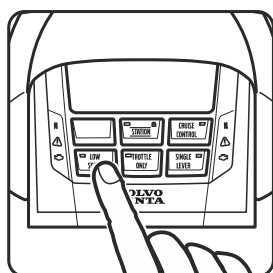
2. Switch on ignition to the port engine.



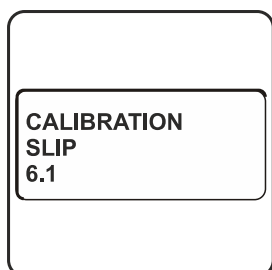
3. Press THROTTLE ONLY



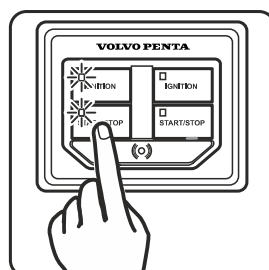
4. Calibration Mode 1.0.



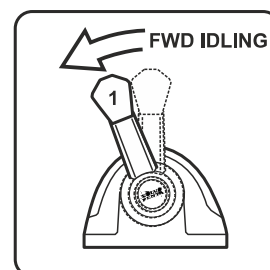
5. Press LOW SPEED.



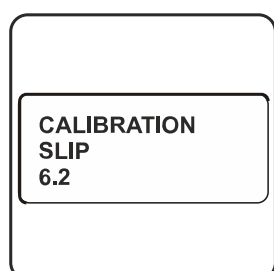
6. Slip calibration 6.1.



7. Start the port engine.



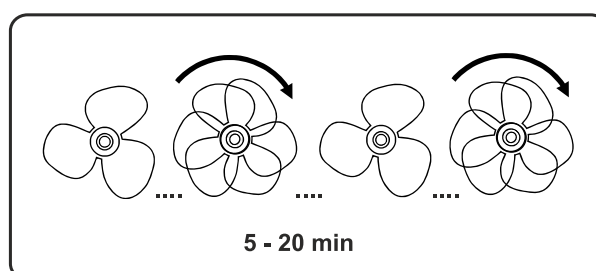
8. Move the levers ahead to position 1.



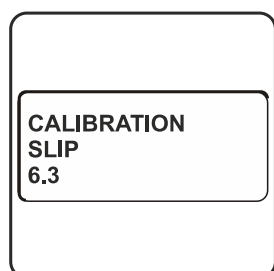
9. Slip calibration 6.2.

WARNING!

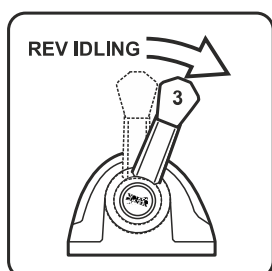
Trolling calibration is now performed. During calibration gears will be engaged and disengaged a number of times. This means the boat will move.



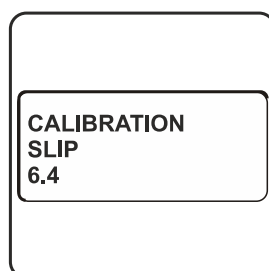
10. Calibration for trolling ahead is performed. Lasts for 5 to 20 minutes.



11. Slip calibration 6.3.



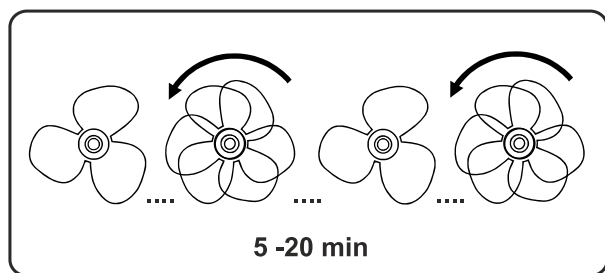
12. Move the levers astern to position 3.



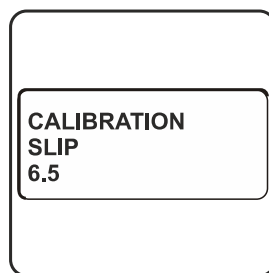
13. Slip calibration 6.4.

WARNING!

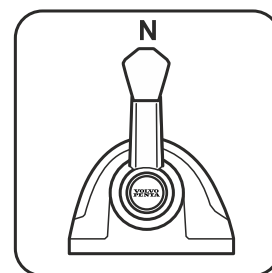
Trolling calibration is now performed. During calibration gears will be engaged and disengaged a number of times. This means the boat will move.



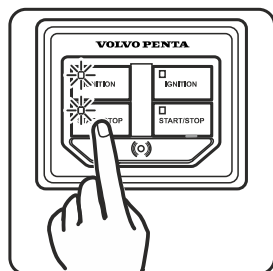
14. Calibration for trolling astern is performed. Lasts for 5 to 20 minutes.



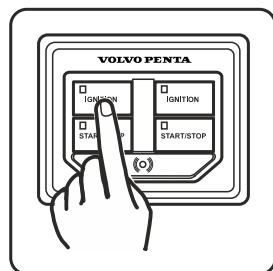
15. Slip calibration 6.5.



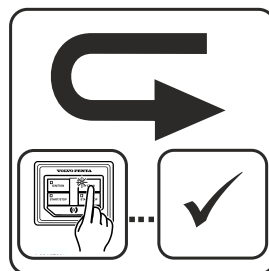
16. Move control to neutral.



17. Stop the engine.



18. Turn ignition off.



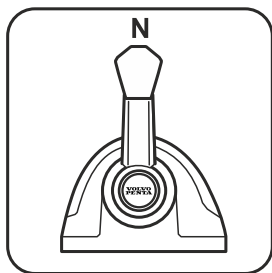
19. Repeat for additional engines. Restart the system to confirm the calibration.

If this error message appears:

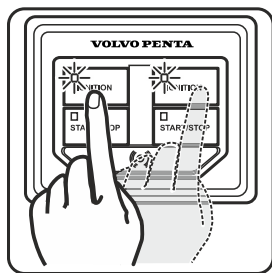
SLIP CALIBRATION FAILED

20. Restart calibration.

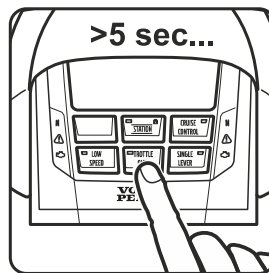
Idling speed calibration



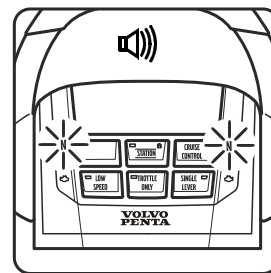
1. Move control to neutral.



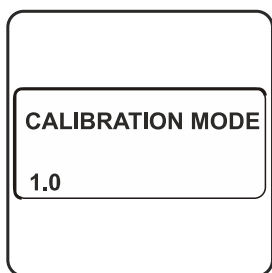
2. Turn the ignition on.



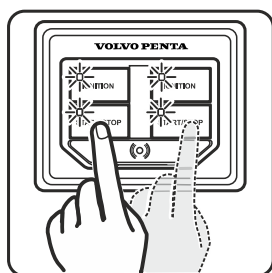
3. Press THROTTLE ONLY



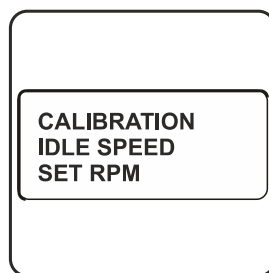
4. Indicates that calibration mode is activated.



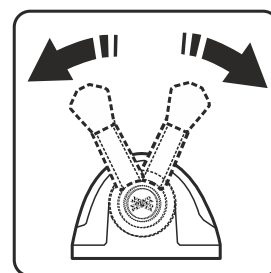
5. Calibration Mode 1.0.



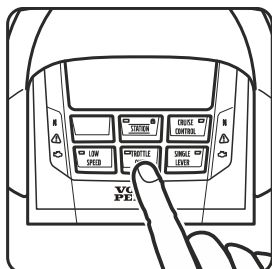
6. Start the engines.



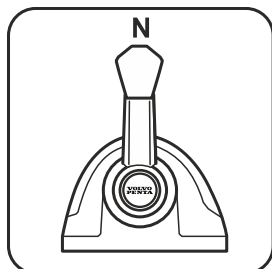
7. CALIBRATION IDLE SPEED SET RPM appears in the display.



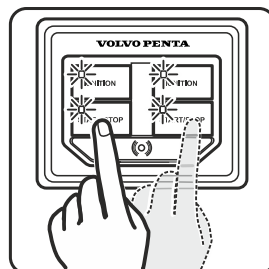
8. Set the preferred idle speed using the control.
D4: 700-750 rpm
D6: 600-650 rpm
D11: 550-700 rpm
D13: 550-800 rpm



9. Confirm: Press THROTTLE ONLY



10. Move control to neutral.



11. Stop the engines.

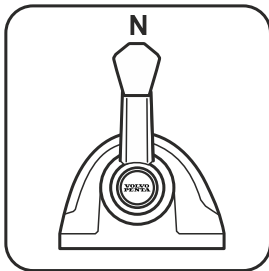


12. Restart the system to confirm the calibration.

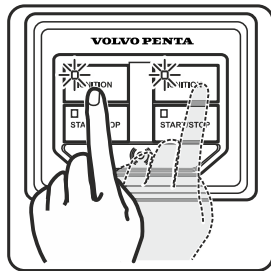
Calibrating the Joystick Function

NOTICE! Calibration may be done in either direction, port or starboard, at one station.

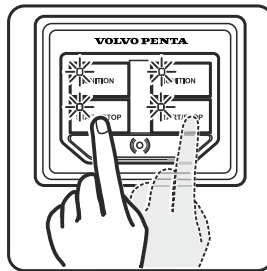
- This calibration need only be made if boat maneuvers do not correspond to joystick movements.
- Make sure there is sufficient space for maneuvering the boat.



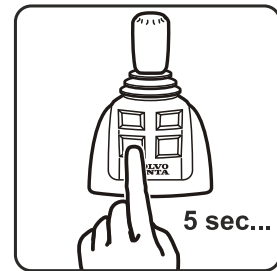
1. Move control to neutral.



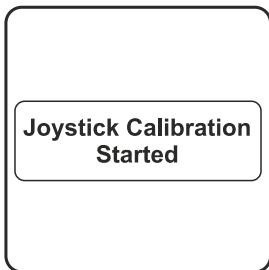
2. Turn the ignition on.



3. Start the engines.



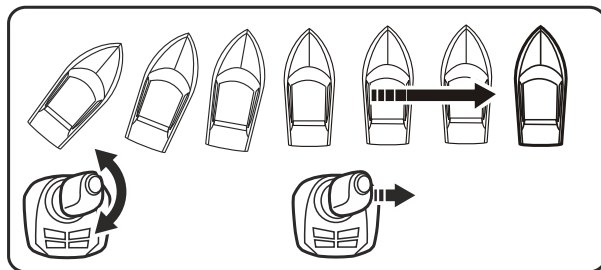
4. Hold the DOCKING button down for five seconds.



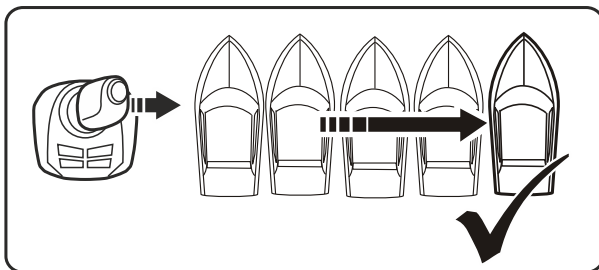
5. Joystick calibration started.



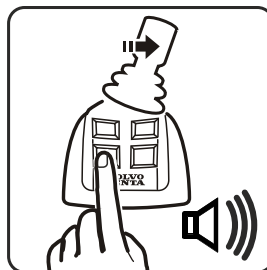
6. Buzzer and light confirm start of calibration.



7. Compensate boat movements with the joystick.



8. The boat must move straight abeam.

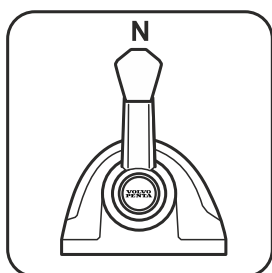


9. Hold the position and confirm by pushing DOCKING.

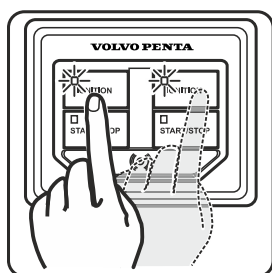


10. Buzzer and light confirm end of calibration. Restart the system to confirm the calibration.

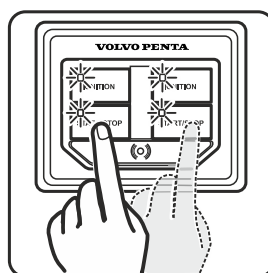
Resetting calibration to the factory setting.



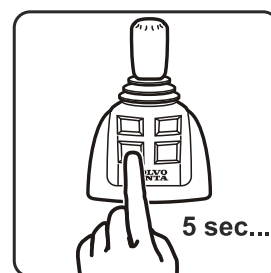
1. Move control to neutral.



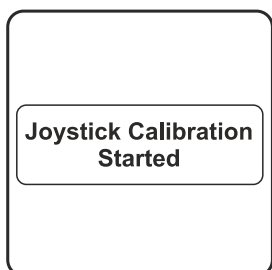
2. Turn the ignition on.



3. Start the engines.



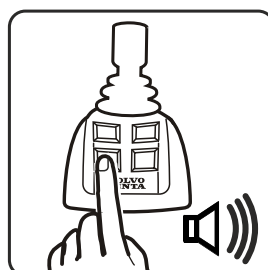
4. Hold the DOCKING button down for five seconds.



5. Joystick calibration started.



6. Buzzer and light confirm start of calibration.



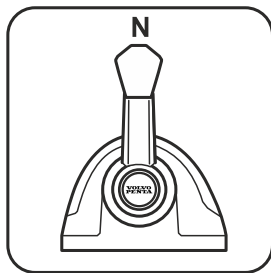
7. Hold the position and confirm by pushing DOCKING.



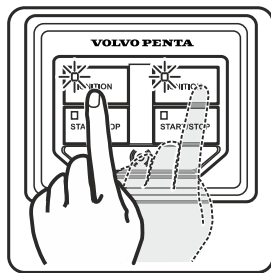
Buzzer and light confirm end of calibration. Restart the system to confirm the calibration.

Joystick Docking force

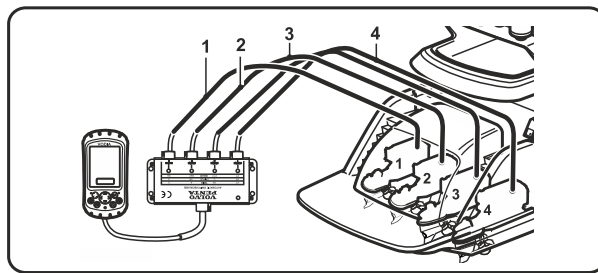
Changes the force when moving abeam. Select between Minimum, Medium and Maximum. Normal force mode and extra force mode are changed by the same factor.



1. Move control to neutral.



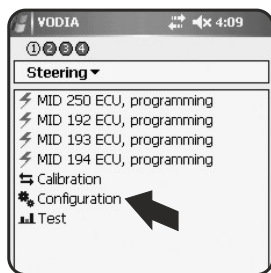
2. Turn the ignition on.



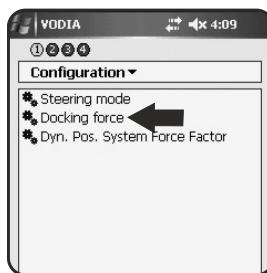
3. Connect to VODIA. (Example shows quad)



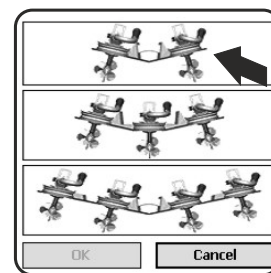
4. Select function group Steering.



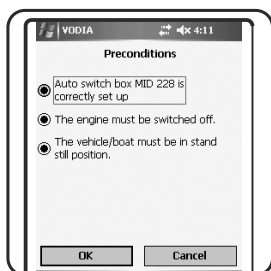
5. Configuration.



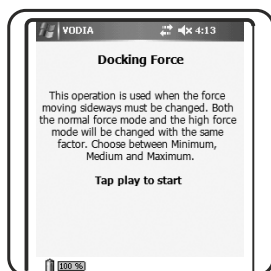
6. Dockingforce.



7. Select installation type.



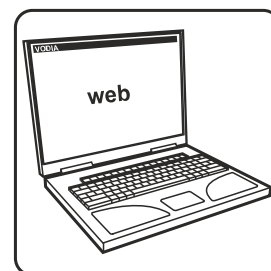
8. Preconditions



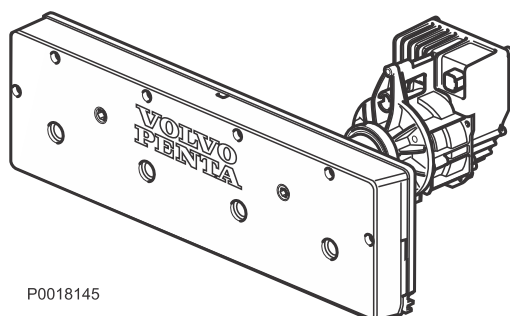
9. Tap Play to start.



10. Report the result within 28 days.



11. VODIA web, select Report software.



P0018145

Calibration of Interceptor System

The IS system must be calibrated in order for it to be activated and function as expected. Calibration is carried out through parameter programming with the aid of the VODIA tool.

NOTICE! It is the boatbuilder's responsibility to decide on the mode selected in settings based on how the boat is intended to handle.

Sea trial with inactive system

Always test the boat under load conditions that represent those of the end user. Assess the boat's characteristics such as trim, visibility, heel in turns and spray. Note the speed at which maximum trim angle is achieved; this value is used for calibrating PZW.

NOTICE! PZW, PZZ and PZX only require calibration on installations with auto function.

Preparations

1. Identify the chassis number

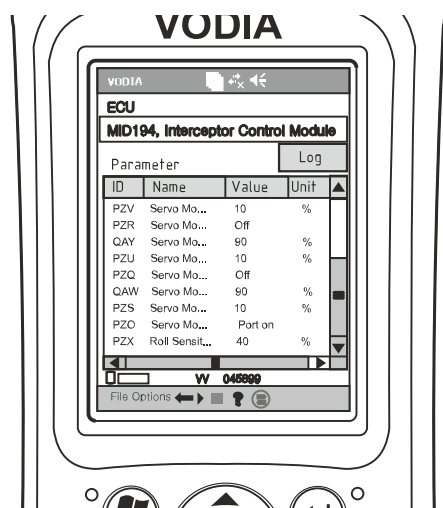
Identify the port driveline chassis number.

2. Order the change kit

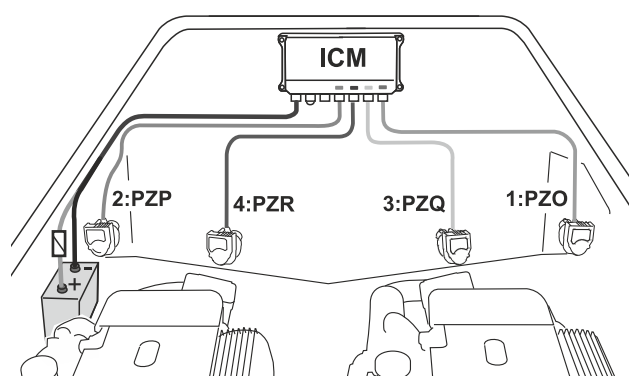
The change kits are available in four versions, auto or manual and two or four interceptors.

3. Download the software package

Go to Volvo Penta Partner Network and download the software package (MID194) to VODIA.



P0018172

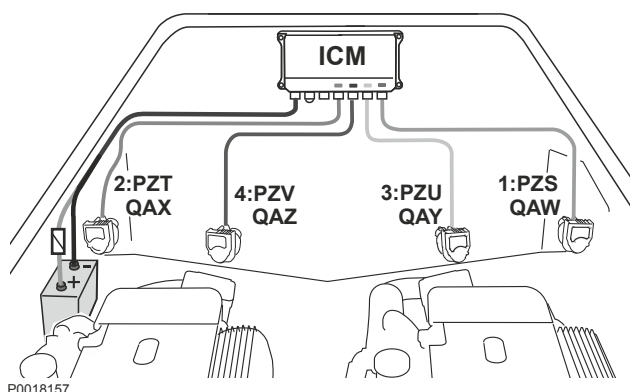
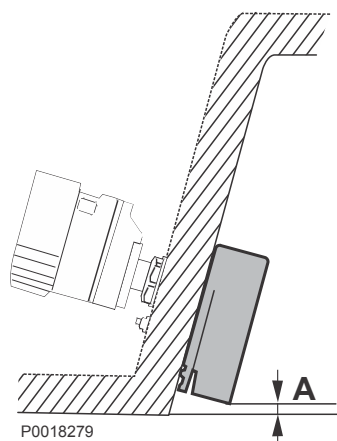


P0018157

4. Program the control unit, ICM.

This is where the parameters PZP, PZR, PZQ and PZO are set; they need not be changed if no fault occurred when ordering the change kit.

NOTICE! Auto-configuration must be carried out once programming is completed so that the EVC system can identify the IS installation.



Adjusting blade position

Check the installed position of the interceptors on the transom, height above bottom (A). The system has a pre-installed value of 10% (5 mm) (0.2") of maximum interceptor blade extension (50 mm) (2").

Measure and take note of any deviation each interceptor may have from the pre-set value. Deviations mean that the parameters below must be set.

1 PZS, Servo Module 1 Zero Offset Position

Adjusting blade start position.

If the unit is installed e.g. 8 mm (0,3") above the bottom the value must be set at 16% (16% of 50 mm = 8 mm) (16% of 2" = 0.3").

2 QAW, Servo Module 1 Working Range

Pre-set value 90%. The sum total of PZS and QAW must be 100%.

E.g. if PZS (start position) is changed to 16% then QAW must be set at 84% (100%-16% = 84%).

3 PZV, Servo Module 4 Zero Offset Position

Adjusting blade start position.

If the unit is installed e.g. 8 mm (0,3") above the bottom the value must be set at 16% (16% of 50 mm = 8 mm) (16% of 2" = 0.3").

4 QAZ, Servo Module 4 Working Range

Pre-set value 90%. The sum total of PZV and QAZ must be 100%.

E.g. if PZV (start position) is changed to 16% then QAZ must be set at 84% (100%-16% = 84%).

5 PZT, Servo Module 2 Zero Offset Position

Adjusting blade start position.

If the unit is installed e.g. 8 mm (0,3") above the bottom the value must be set at 16% (16% of 50 mm = 8 mm) (16% of 2" = 0.3").

6 QAX, Servo Module 2 Working Range

Pre-set value 90%. The sum total of PZT and QAX must be 100%.

E.g. if PZT (start position) is changed to 16% then QAX must be set at 84% (100%-16% = 84%).

7 PZU, Servo Module 3 Zero Offset Position

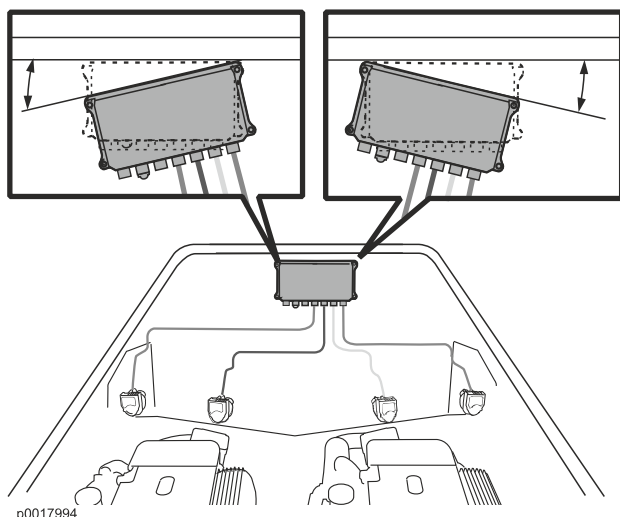
Adjusting blade start position.

If the unit is installed e.g. 8 mm (0,3") above the bottom the value must be set at 16% (16% of 50 mm = 8 mm) (16% of 2" = 0.3").

8 QAY, Servo Module 3 Working Range

Pre-set value 90%. The sum total of PZU and QAY must be 100%.

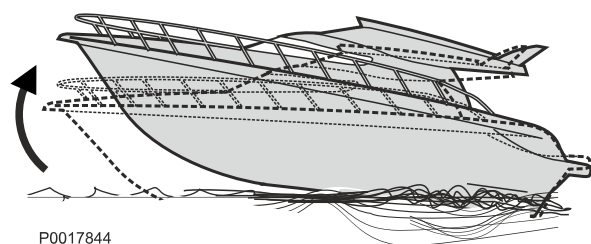
E.g. if PZU (start position) is changed to 16% then QAY must be set at 84% (100%-16% = 84%).



PZY, Roll Sensor Offset

The PZY parameter is used to enable the system to generate a flat thwartships trim angle. If the ICM unit is correctly installed in horizontal alignment with the boat's intended horizontal plane, the value needs no adjustment.

- 1 Check that the control unit (ICM) is installed straight in relation to the boat's horizontal plane. Measure and note any degrees of deviation.
- 2 Adjust PZY with the noted deviation.
- 3 Perform a test run at planing speed to verify the settings.
- 4 Adjust further as necessary.
Positive values adjust port side up/ starboard side down.
Negative values adjust port side down/ starboard side up.



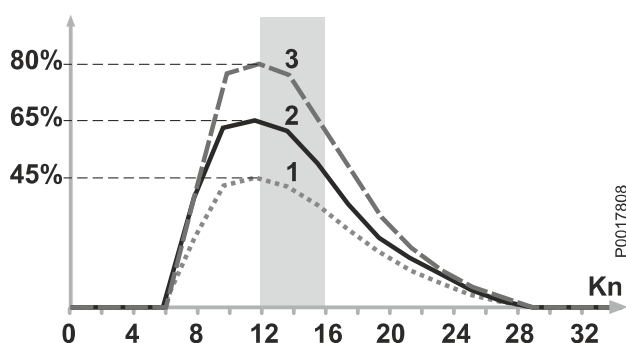
PZW, Automatic Trim Demand

Setting the boat's angle of attack.

- 1 **Select a suitable calibration graph**
Select the plot group based partly on the speed the boat has at maximum trim angle and partly on its top speed. The plot groups are 1-3, 4-6, 7-9, 10-12, 13-15 and 16-18 as illustrated below.
- 2 Set the selected graph in PZW. We recommend initiating the test run with the graph in the middle of the selected plot group, i.e. 2, 5, 8, 11, 14 or 17.
- 3 **Verification runs**

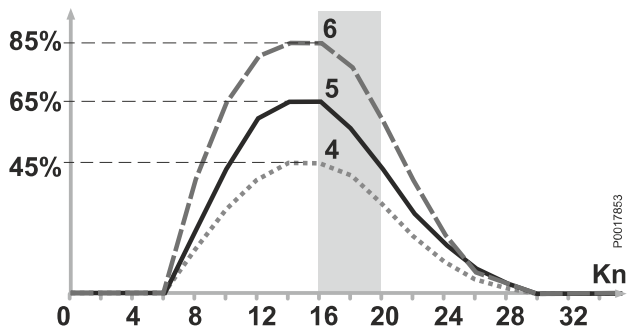
NOTICE! Verification of the graph selected must be done in test runs across the boat's full speed range.

Select how great compensation must be by testing the boat on a selected graph. If the angle of attack must be reduced select a higher graph number, and if it must be raised select a lower graph number.



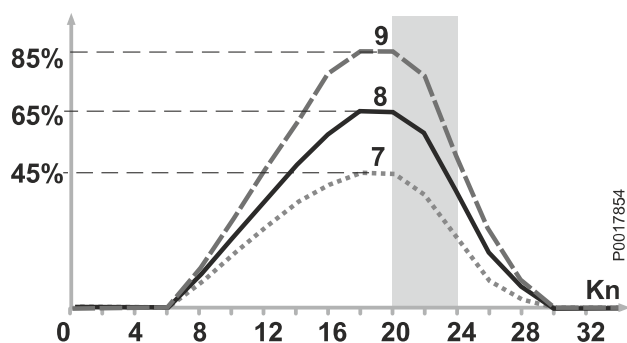
Graph 1-3

This plot group is suitable for boats whose maximum trim angle is achieved at 12–16 knots.



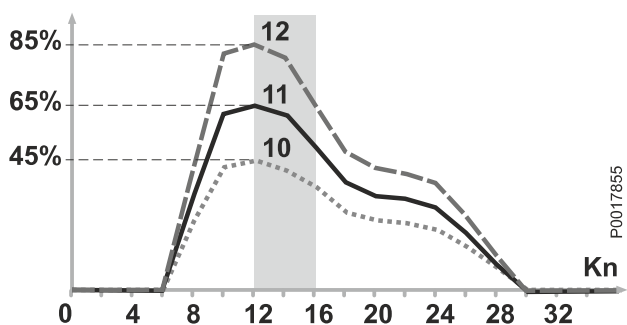
Graph 4-6

This plot group is suitable for boats whose maximum trim angle is achieved at 16-20 knots.



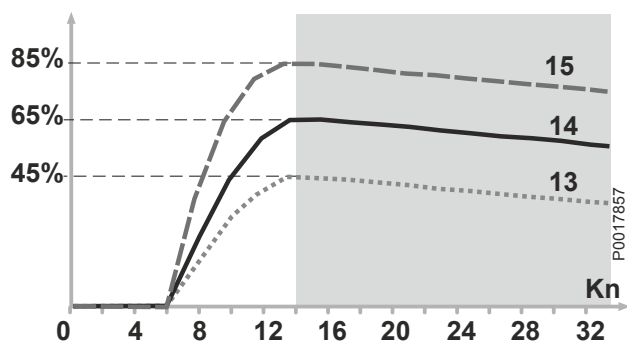
Graph 7-9

This plot group is suitable for boats whose maximum trim angle is achieved at 20-24 knots.



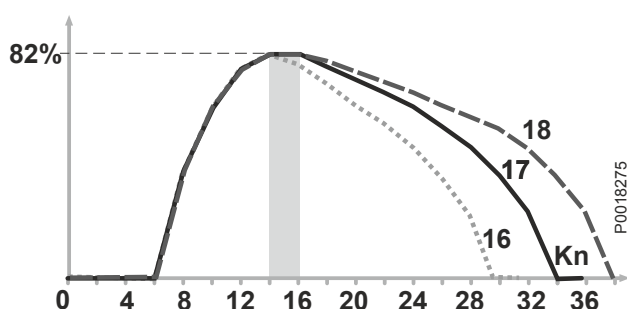
Graph 10-12

This plot group is suitable for boats whose maximum trim angle is achieved at 12-16 knots. E.g. for AQ-installations with PTA and IS collaboration.



Graph 13-15:

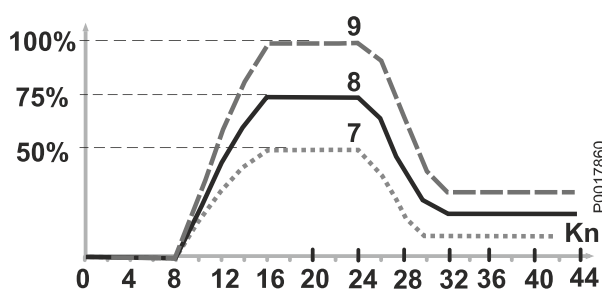
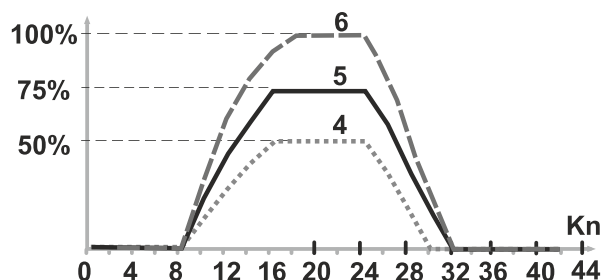
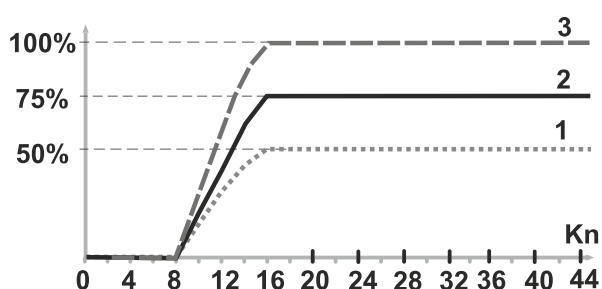
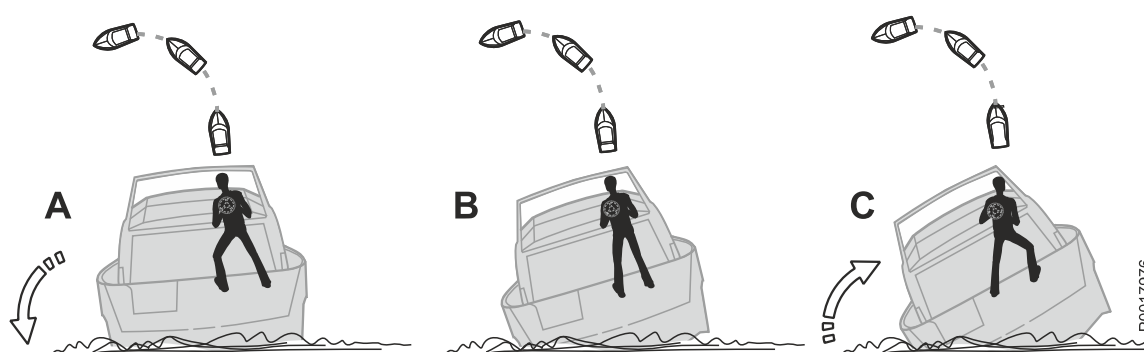
Slower types of boat. Autotrim compensation is required across the boat's entire planing speed range.



Graph 16-18:

Faster types of boat. Autotrim compensation is required across the boat's entire planing speed range.

PZZ, Turn Demand (Steering Roll Compensation)



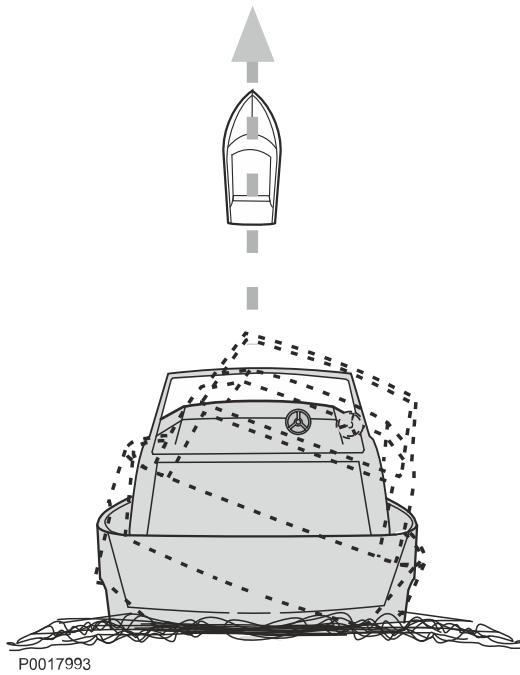
Setting how aggressively the system must compensate heel in connection with the application of helm, when the helmsman steers the boat with the aid of a wheel or tiller (Joystick).

The illustrations above show a boat at planing speed when the helmsman makes a hard turn that would normally cause the boat to heel. Calibration takes place at two speeds in which boat handling in the turn is assessed according to the following:

- A** – an increase in heel during the turn is desired.
- B** – the boat heels to the preferred extent in the turn.
- C** – an decrease in heel during the turn is desired.

Selecting a suitable calibration graph

- 1 Set graph 8 and test run the boat at a speed of 20-25 knots. Assess boat handling according to A, B or C.
- 2 **If A is selected** – switch to graph 7.
If B is selected – retain graph 8.
If C is selected – switch to graph 9.
- 3 Increase speed to 30–35 knots and once again assess boat handling according to A, B or C.
- 4 **If graph 7 assessed according to:**
A – switch to graph 4 (heel increases).
B – retain graph 7 (heel maintained).
C – switch to graph 1 (heel decreases).
- 5 **If graph 8 assessed according to:**
A – switch to graph 5 (heel increases).
B – retain graph 8 (heel maintained).
C – switch to graph 2 (heel decreases).
- 6 **If graph 9 assessed according to:**
A – switch to graph 6 (heel increases).
B – retain graph 9 (heel maintained).
C – switch to graph 3 (heel decreases).



PZX, Roll Sensitivity (List Compensation)

The system attempts to generate a level thwarts trim angle on a straight or almost straight heading at planing speed. The value PZX is pre-set at 50, which works well on most planing boats, but is variable from 0-100.

NOTICE! Tests and adjustments must be made at planing speeds (>20 kn).

- Adjust PZX in increments of 2 per test run.
- Adjust the value **up** if the boat does not stabilize quickly enough.
- Adjust the value **down** if the boat continues to oscillate at planing speed.

ODG, Trim Button Cross-coupling

Changes the interceptor blade affected according to the button depressed on the control. ODG is pre-set to OFF = Port button down moves the starboard interceptor down; port button up moves the starboard interceptor up and vice versa.

If the opposite is preferred, set ODG to ON (cross-coupled) = port button down moves the port interceptor down; port button up moves the port interceptor up and vice versa.

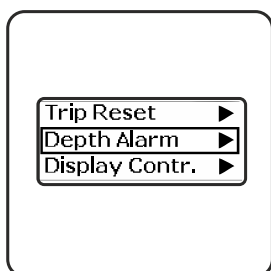
NOTICE! If ODG is set to ON (cross-coupled) it should be noted in the owner's manual.

Depth Alarm

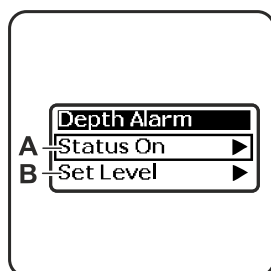
Setting for the depth alarm level on Volvo Pentas echo sounders.

The setting need only be made at one helm station to be displayed on all screens at all helm stations.

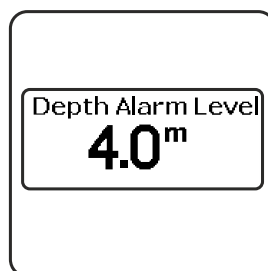
NOTICE! Ignition must be on for all drivelines.



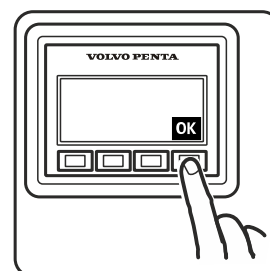
1. Scroll to Depth Alarm in the Settings menu



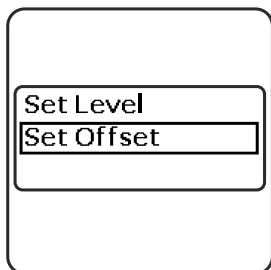
2. **A** On/Off.
B Specify level.



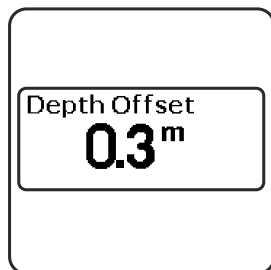
3. Scroll to Depth Alarm Level.



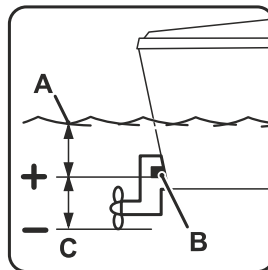
4. Confirm.



5. Select Depth Offset.



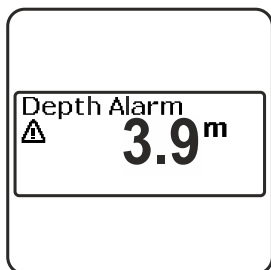
6. Set the value.



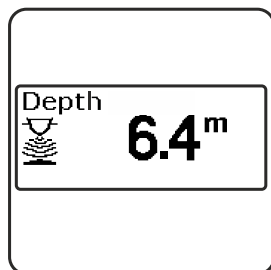
7. **A** Waterline.
B Echo sounder.
C Lowest point.

Set the distance for the echo-sounder/ waterline or echosounder/lowest point to the display depth.

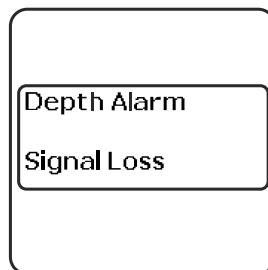
8. Distance A-B: positive value. Distance B-C: negative value.



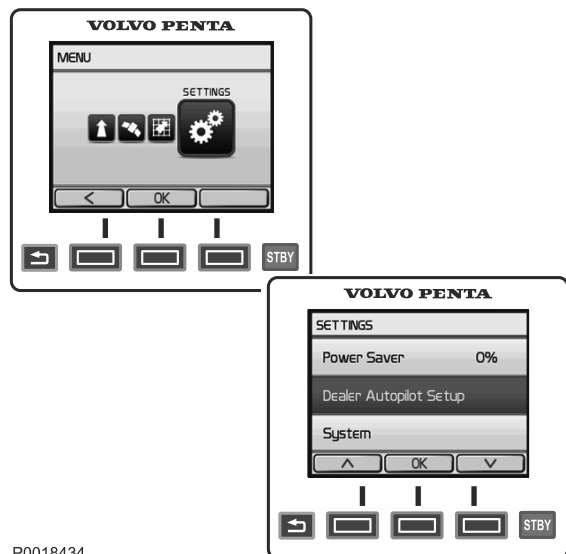
9. Depth Alarm: appears and sounds every 30 seconds.



10. Ceases when depth exceeds alarm level or when confirmed.



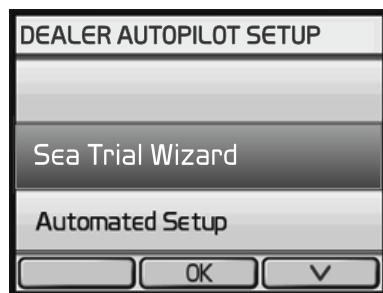
11. Signal fault. E.g. sensor not working.



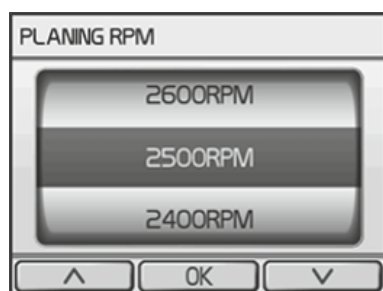
P0018434



P0018417



P0018429



P0018430


Autopilot


The autopilot must be configured and tuned to suit the boat. Start by running the Sea Trial Wizard which calibrates the basic sensors. It is important to run the wizard under circumstances and load conditions that are representative for the end user.

NOTICE! If an interceptor system (IS) is installed it must be calibrated and in auto mode before the autopilot is calibrated.

Autopilot buttons

Use the panel buttons to scroll through menus and confirm settings. Menu buttons function are shown on the display.

 – Return to the previous menu. If the button is held down the display returns to the Autopilot menu.

 – Menu buttons function are shown on the display.

Proceed to autopilot configuration by scrolling to *Settings* > *Dealer settings, autopilot*.

The display will show the message **WARNING!** *Authorized Volvo Penta OEM or dealer only*. Press OK to confirm the message.

Sea Trial Wizard

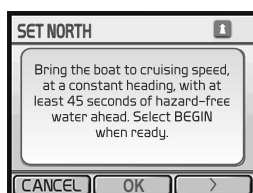
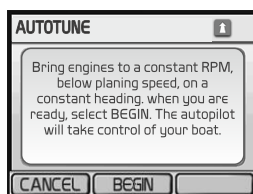
The wizard calibrates the compass, adjusts the autopilot and sets North (if a GPS unit is connected).

⚠ CAUTION!

This procedure requires the engine to be running. The gear will be engaged, be prepared for sudden movements.

NOTICE! The wizard must be run in calm, open waters.

- 1 Scroll to **Sea Trial Wizard**. Press OK.
- 2 Set the boat's planing rpm so that it corresponds to the boat's tachometer. Confirm with OK.



- 3 Press BEGIN to start the Sea Trial Wizard. Follow the instructions on the display.

NOTICE! The autopilot will take over control of the boat at times; be prepared to take back control.

- 4 Test the autopilot after running the Sea Trial Wizard.
- 5 The Sea Trial Wizard may be run several times fully or in part.

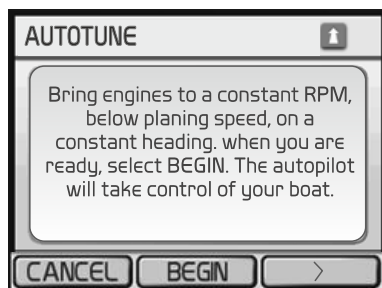
Test Drive

- 1 Run the boat dead ahead at low speed. The boat should not rock too much.
- 2 Turn the boat with the aid of the autopilot. The boat must turn smoothly; not too quickly nor too slowly.
- 3 If the boat turns too quickly or too slowly adjust using the autopilot *Acceleration limiter*.
- 4 If the boat is rocking or not correcting the course properly, adjust using the autopilot *Rudder sensitivity*.
- 5 Perform steps 3–4 until the boats turns smoothly and does not rock too much.
- 6 In the case of planing boats, repeat steps 1-4 at a higher speed.
- 1 Go to the settings menu and scroll to System > System information
- 2 Hold down the center button on the panel for 5 seconds.
- 3 Return to the settings menu using the back button.

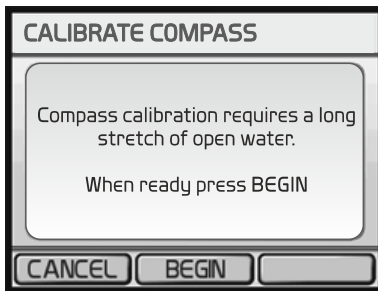
Automated Set Up

Autotune

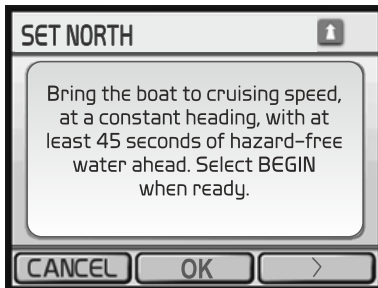
- 1 Make sure you have a long stretch of open water ahead.
 - 2 Adjust the throttle so that the boat is below planing speed.
 - 3 Press BEGIN.
- NOTICE!** The boat will zig-zag while adjustment is taking place.
- 4 When autotune is complete a message will be shown on the display. Press OK.



P0018431



P0018432



P0018433

Calibrate Compass

- 1 Run the boat at a chosen course.
- 2 Press BEGIN and continue on that course.
- 3 Follow the instructions on the display and turn slowly to starboard without letting the boat heel. Run as steadily and smoothly as possible. The autopilot will indicate if the speed maintained is too fast, too slow or just right.
- 4 When calibration is complete a message will be shown on the display. Press OK.

Set North

This setting is only shown when a GPS unit is connected. If a GPS is lacking set North using *Fine tuning course* under the *Navigation settings* menu.

- 1 Make sure you have at least 45 seconds of hazard-free, open water while at planing speed available.
- 2 Run the boat dead ahead at cruising speed.
- 3 When the setting is complete a message will be shown on the display. Press OK.

Speed Source Setup	
Planing RPM	3000
Low RPM Limit	500
High RPM Limit	6000
<input type="button" value="▲"/> <input type="button" value="OK"/> <input type="button" value="▼"/>	

P0018413

Speed Source Set up

- **Tachometer Data**
Compares the RPM readings on the Autopilot with the tachometer.
- **Planing RPM**
Adjusts the boat's planing RPM in cases where the autopilot does not correspond to the boat's actual planing RPM. Use the arrow buttons to adjust.
- **Low RPM Limit (Low RPM Limit)**
Adjusts the engine idle RPM in cases where it does not correspond to the RPM the autopilot shows. Use the arrow buttons to adjust.
- **High RPM Limit (High RPM Limit)**
Adjusts engine RPM at full throttle in cases where it does not correspond the RPM the autopilot shows. Use the arrow buttons to adjust.

Autopilot Tuning

NOTICE! If set values are too high the autopilot may become overactive and constantly seek to adjust the course. An overactive autopilot can cause wear on the drive unit and drain the battery.

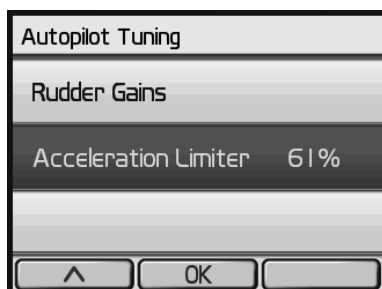
Low Speed	40%
Low Speed Counter	74%
High Speed	40%
High Speed Counter	74%
<input type="button" value="▲"/> <input type="button" value="OK"/> <input type="button" value="▼"/>	

P0018410

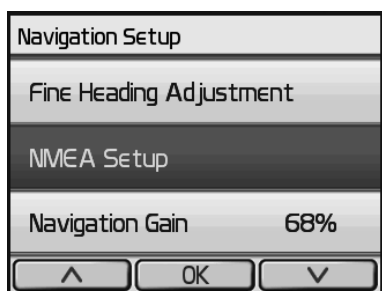
- **Rudder Gains**
Low speed and high speed sets the rudder gain for how strictly the autopilot holds a course and how tightly it performs turns. Low speed and high speed counters correct the autopilot if it turns too much or too little from a specified position.

NOTICE! Adjust rudder sensitivity in small increments and by only one value at a time. Carry out a test run after each adjustment.

- **Low Speed**
Adjusting the rudder angle at speeds below planing speed.
- **Low Speed Counter**
Adjusting the autopilot at speeds **below** planing speed in cases where turns are not executed correctly.
Too high a value may cause the boat to stop turning too early and then slowly approach the correct value.
Too low a value may cause the boat to turn too much and then return to the correct value.
- **High Speed**
Adjusting the rudder angle at speeds above planing speed.
- **High Speed Counter**
Adjusting the autopilot at speeds **above** planing speed in cases where turns are not executed correctly.
Too high a value may cause the boat to stop turning too early and then slowly approach the correct position.



P0018414



P0018415

Too low a value may cause the boat to turn too much and then return to the correct position.

- **Acceleration Limiter**

Limits how quickly the autopilot yaws.
Increase the value if the boat yaws too quickly.
Reduce the value if the boat yaws too slowly.

Navigation Set up

- **Fine Heading Adjustment**

This setting is only shown when no GPS unit is connected.

- 1 Set North using a hand-held compass.
- 2 Adjust North on the autopilot until it corresponds with North on the magnetic compass.
- 3 Confirm with OK.

- **NMEA Set up**

- **NMEA Checksum**

If a GPS unit connected to NMEA 0183 calculates an erroneous checksum it is possible to disable checksum monitoring.

NOTICE! When the function is disabled data reliability may be at risk.

- **Reversed XTE**

If the connected GPS unit sends an erroneous heading signal (port confused with starboard) it can be corrected by switching the setting on or off.

- **Navigation Gain**

Setting how aggressively the autopilot counteracts deviations from a course set in the plotter.

Too high a value may cause the boat to swing over the course. Too low a value may cause the autopilot to react too slowly to deviations from the course.

- **Navigation Trim Gain**

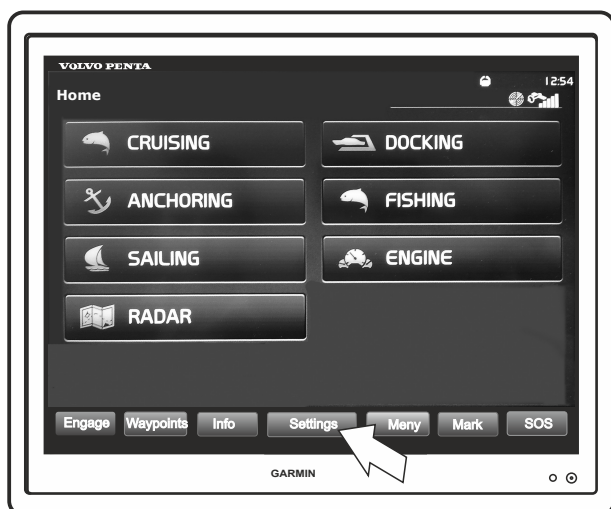
Fine tuning of acceptable course deviations. Only adjust this value if *Navigation search* has been adjusted.

Too high a value may overcompensate for deviations from the set course. Too low a value allows excessive deviations from the set course.

Volvo Penta Glass Cockpit, calibration

NOTICE! Applies only to EVC-E2.
All EVC functions are integrated in the touch screen.

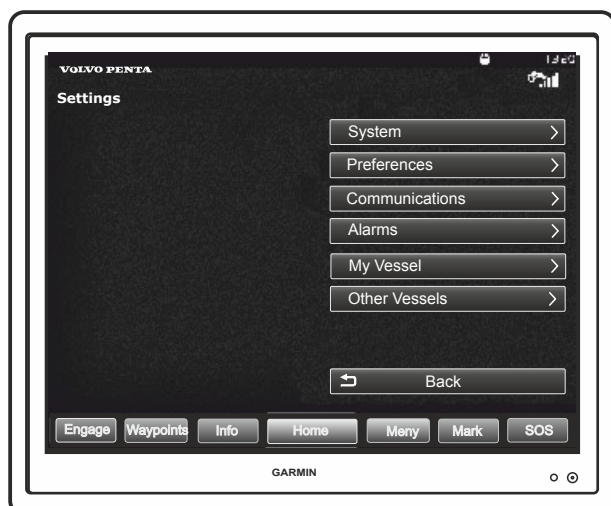
Select **Settings** in the main menu to reach calibration and settings.



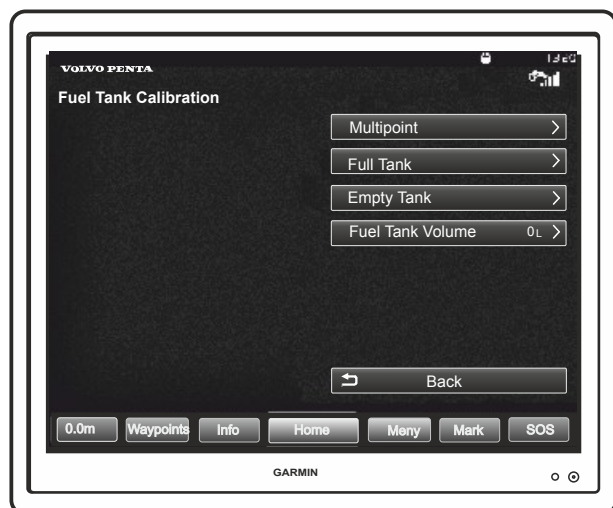
P0018820

Select **My Vessel** for calibration and settings. Follow the instructions shown on screen.

Select **Home** to return to the main menu.



P0019939



P0019944

Fuel tank settings

Carry out calibration in the following sequence:

- **Fuel Tank Volume**
- **Empty tank**
- **Full tank**
- **Multipoint**

Each menu has sub menus.

Select *Start* to begin the wizard concerned and then follow the instructions on the display.

Autopilot calibration

The autopilot must be configured to suit the boat. Start by running the Sea Trial Wizard which calibrates the basic sensors. It is important that the wizard be run under circumstances and load conditions that are representative for the end user.

NOTICE! If an interceptor system (IS) is installed it must be calibrated and in auto mode before the autopilot is calibrated.

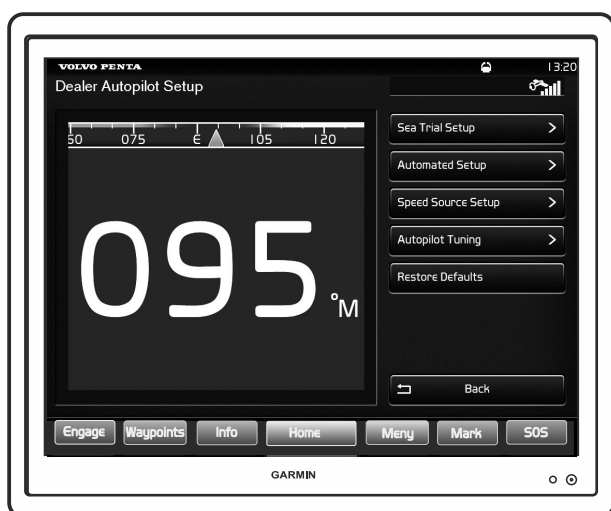
Autopilot menus

Scroll to the main autopilot menu: Home> Settings> My Vessel> Dealer Autopilot setup

The display will show the message ***WARNING!*** *Authorized Volvo Penta dealer or OEM only.* Confirm the message: Press OK.



P0018821



P0018822

The autopilot main view shows the following choices:

- Sea Trial Wizard
- Automated Set Up
- Speed Source Set Up
- Autopilot Tuning
- Restore Defaults

Each menu has sub menus.

Select *Start* to begin the wizard concerned and then follow the instructions on the display.

Sea Trial Wizard

CAUTION!

This procedure requires the engine to be running. The gear will be engaged, be prepared for sudden movements.

NOTICE! The wizard must be run in calm, open waters.



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- **Planing RPM**

Adjust the boat's planing rpm so that it corresponds to the boat's tachometer.

- **High RPM Limit. (High RPM Limit)**

Adjusts engine rpm at full throttle in cases where it does not correspond the rpm the autopilot shows. Select a value from the list to adjust.

- **Calibrate Compass**

Make sure you have a long stretch of open water ahead.

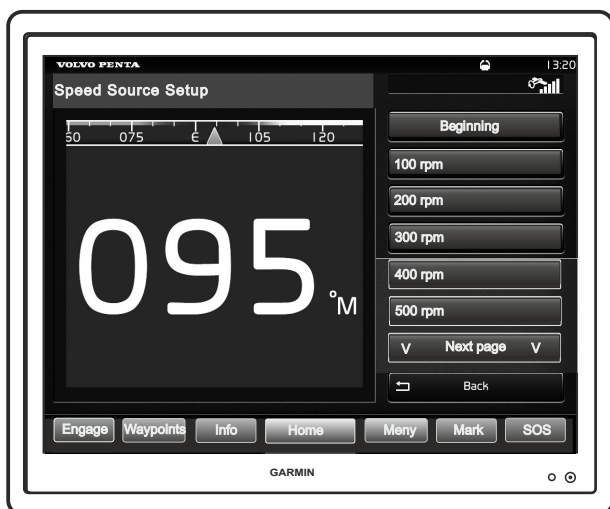
- **Autotune**

- **Set North**

When the Sea Trial Wizard is finished **Ready** will be shown to the right of the wizard concerned. Settings can also be calibrated individually in the following menu groups.



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Automated Setup

• Autotune

NOTICE! If set values are too high the autopilot may become overactive and constantly seek to adjust the course. An overactive autopilot can cause wear on the drive unit and drain the battery.

Run the boat dead ahead at low speed. Start the wizard. The boat will change course in a cyclic zig-zag for around 15 seconds.

• Compass Calibration

Make sure you have at least 45 seconds of hazard-free water ahead.

• Set North

Make sure you have at least 45 seconds of hazard-free water ahead.

• Fine Heading Adjustment

Speed Source Set Up

• Low RPM Limit. (Low RPM Limit)

Adjusts the engine idle rpm in cases where it does not correspond to the rpm the autopilot shows.

• High RPM Limit. (High RPM Limit)

Adjusts engine rpm at full throttle in cases where it does not correspond the rpm the autopilot shows.

• Planing RPM

Adjusts the boat's planing rpm in cases where the autopilot does not correspond to the boat's actual planing rpm.



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Autopilot Tuning

Use the *Up* and *Down* buttons to adjust the value.

- **Acceleration Limiter**

Limits how quickly the autopilot yaws. Increase the value if the boat yaws too quickly. Reduce the value if the boat yaws too slowly.

- **Rudder Gains**

Low speed and high speed set rudder angle to how strictly the autopilot holds a course and how tightly it performs turns. Low speed and high speed counters correct the autopilot if it turns too much or too little from a specified position.

NOTICE! Adjust rudder sensitivity in small increments and by only one value at a time. Carry out a test run after each adjustment.

Low Speed

Adjusting the rudder angle at speeds below planing speed.

Low Speed Counter

Adjusting the autopilot at speeds **below** planing speed in cases where turns are not executed correctly.

Too high a value may cause the boat to stop turning too early and then slowly approach the correct value.

Too low a value may cause the boat to turn too much and then return to the correct value.

High Speed

Adjusting the rudder angle at speeds above planing speed.

High Speed Counter

Adjusting the autopilot at speeds **above** planing speed in cases where turns are not executed correctly.

Too high a value may cause the boat to stop turning too early and then slowly approach the correct position.

Too low a value may cause the boat to turn too much and then return to the correct position.

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